

CONSUMERS' RESEARCH BULLETIN



General Bulletin Number

October, 1937



Co
ing
the

Consumers' Research BULLETIN

Issued by

Consumers' Research, Inc., Washington, N. J.

Vol. 4 (new series)

No. 2

(Vol. 7, No. 1 of the *General Bulletin* series)

Editors

F. J. SCHLINK
M. C. PHILLIPS

J. B. MATTHEWS
E. G. WATTS

Technical Staff

R. JOYCE

E. W. CHENEY

This Issue is Not Confidential.

CONTENTS FOR OCTOBER, 1937

	PAGE
Off the Editor's Chest	1
Golf Balls	2-3
What's in the Can	4-6
Vacuum or "Thermos" Bottles	6-7
Flashlights	7-10
Radio Today, by Gareth Smith	11-13
Encyclopedias and Reference Books	14-16
Private Water-supply Systems	17
Electric Ironing Machines	18-21
Electrical Heating Appliance Cord Sets and Lamp Cords	21-23
Binders for CR Material Now Available	23
Signs and Portents	24

This issue is one of 4 *Bulletins* issued during the year by Consumers' Research which are not confidential. This *Bulletin* may be freely discussed with friends. We hope that you will use the opportunity to show them what CR is doing for consumers. The *General Bulletin* is available not only to individuals, but to libraries, schools, and other groups, at \$1 for the subscription year October through June. The next non-confidential issue will be the January, 1938, number. *Responsibility for all specific statements of fact or opinion at any time made by Consumers' Research lies wholly with the technical director and staff of the organization. *Please send notice of any change of address at least two weeks before it is to take effect, accompanying your notice with statement of your previous address. Duplicate copies cannot be sent to replace those undelivered through subscriber's failure to send advance notice, except at the regular price for orders of such material as back issues. N.B.—For a detailed account of CR's early history, policies, and information as to the answering of special inquiries about commodities, subscribers are urged to read the *Introduction to Consumers' Research* which is sent to anyone without charge.

Symbols used to indicate sources of data and bases of ratings:

A—recommended on basis of quality.

AA—regarded as worthy of highest recommendation.

B—Intermediate with respect to quality.

C—not recommended on basis of quality.

cr—information from Consumers' Research's own tests or investigations.

1, 2, 3—relative prices, 1 being low, 3 high.

36, 37—year in which test was made or information obtained by the staff of Consumers' Research.

Off the Editor's Chest

"THE arm of Government is often a poor cure for abuse, for it becomes often a restraint of liberty. The safeguard against the invasion of Government into the lives and liberties of our people is that we shall find solutions and cure abuses outside the Government." Although these words were uttered by an official, later President, more than ten years ago, they have a pertinence today which exceeds by far any importance which could have been attached to them by those who heard them at the time of their delivery.

Consumers' Research may justly lay claim to uniqueness on the ground that it seeks to provide means to deal with abuses of merchandising and to find solutions for the consumer's intricate technical problems *outside the Government*.

With the Government following the tendencies of the last decade or two in European dictatorship countries, and invading the lives and liberties of the people on every hand, and with increasing demands from many quarters that the Government further extend its powers of coercion and restraint, Consumers' Research holds that, at present, consumers need *self-help*, *self-education*, and *self-reliance* to deal in their own ways with their own problems. Consumers may be sure that a federal government which seeks to correct a grave malady of distribution by *decreasing* the supply of cotton, bread, and potatoes and increasing their cost and the cost of all other commodities to consumers, is not a government which it would be wise to entrust with larger responsibilities and larger powers of control in the activities of industrial and commercial enterprise.

The *Annual Cumulative Bulletin* of Consumers' Research, issued in September of this year, represents an approach to the consumer's problem which could not possibly be made by the Government at Washington without presupposing other foundations of government and society than those which obtain under the American system.

Only freely competitive industries and merchandising establishments (enterprises competing both as to the price and the quality of goods produced) together with a host of freely critical consumers able to buy or refrain from buying a given article or commodity, as they choose, provide the factors necessary for a continually advancing standard in the quality of consumer's goods and services. Collectivism, whether in the form of red fascism or black or brown, is, or quickly becomes, a species of monopoly which tolerates no really free competition in the production and distribution of goods and no really free criticism from the users of goods. A critical consumer is the bane of the authoritarian state, and criticism of the goods he buys under state monopoly or state control of state-supported corporate monopolies becomes treason to the "leader" or whoever insists he has the peoples' mandate to order all of their affairs.

GOLF BALLS

CONSUMERS' RESEARCH is now able to say that all advertising claims to the contrary, a golfer's score is determined primarily by his skill and positively not to any significant extent by what he pays for his golf balls.

Probably most golfers select a golf ball on the basis of "click," "putting feel," or other equally intangible factor which advertising would have golfers believe can be obtained in greater measure as one pays more for a ball, and particularly as one buys *Blank's* ball in preference to *Blenk's*, *Blink's*, *Blonk's*, or *Blunk's*. Perhaps some players choose balls in order to obtain "Roto-Active Fly-Wheel Action," a "talented golf ball," or the "sweetest ball that ever clicked off a club head," or perhaps it is only an autograph of a highly paid professional that is wanted. There is much pseudoscience in the advertising of golf balls which endows them with "improvements" as, for example, special weight distribution to impart added spin. The purchaser should be on his guard against such

"inventions"; in general, it would be a good policy not to believe what the copy writers say when there is an air of scientific discovery about it.

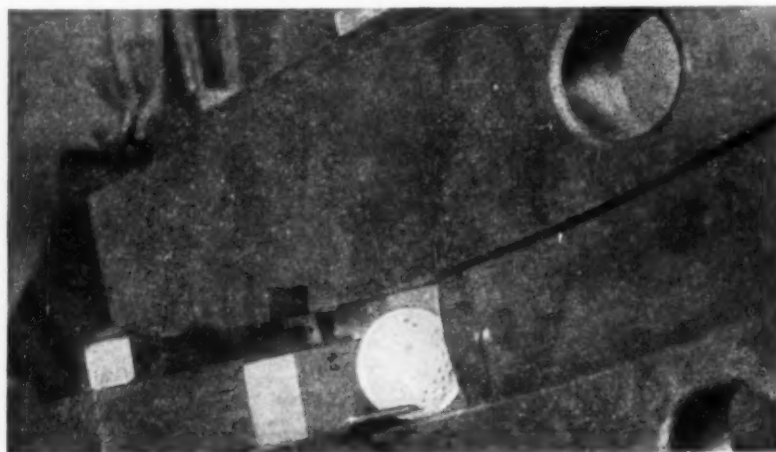
Advertising writers, of course, reserve the most marvelous and exclusive constructions for the most expensive balls, and they wouldn't for the world have you believe that the best golf score is possible when using a ball costing under seventy-five cents or a dollar. Most manufacturers make a thirty-five-cent ball "that is outstanding in its price range," but "for golfers who are intent on getting the most out of their game" they offer "top-quality seventy-five-cent balls."

There is much mystery about the details of construction of golf balls. Their centers or cores, for example, are sometimes hard, sometimes liquid, sometimes a paste. The liquid may be honey or some "secret" substance peculiar to the manufacturer. Paste and liquid centers have the advantage of providing a means by which the windings can be put on under a higher tension intended to produce a livelier ball. This is done by freezing the center and winding rubber thread on the frozen core to a tension determined by the strength of the thread. Later, when the center thaws, the tension is increased by the expansion taking place as the core changes from the frozen to the liquid state, making the ball somewhat

harder and more elastic in the zones near the core. Sometimes extra internal pressure and tightness are provided by putting into the ball, at the time it is made, "dry ice" (frozen carbon dioxide), which turns into carbon dioxide gas under pressure immediately afterwards.

The best cover is one which is thin and tough—characteristics which to some extent are mutually opposed. By test, however, it was found that a thick cover was not necessarily durable nor was a thin cover necessarily fragile. Prolonged immersion in water imparts a peculiar stone-like quality to golf balls. Repainted balls offered for sale by the caddy may for this reason be quite worthless.

Consumers' Research has tested a dozen well-known brands of golf balls ranging in price from twenty-one cents to a dollar. They were weighed and measured; compared for distance in driving and for accuracy of rolling and putting on a standard, uniform surface; and the durability of their covers was estimated.



A BALL BEING SUBJECTED TO TEST FOR DURABILITY OF COVER IN AN IMPACT TEST MACHINE

ted.

Since there are no generally accepted test methods for determining the comparative performance of golf balls, it was necessary for Consumers' Research to devise methods which would show the differences in performance between different balls. Since the methods available are so little known, and because of the wide interest by the general public in the performance of sporting goods, it may be of interest to many of our readers to have a description of the methods of test presented in somewhat greater detail than is usually done in our reports.

The comparative durability of the covers of the golf balls was determined by subjecting each ball to blows of different intensities such as it would be subjected to when used in the game of golf. This was done in an impact testing machine (illustrated) calibrated to show the energy of impact delivered by a curved-edge hammer to the golf ball. A new point of the surface of the ball was presented for each blow, and the impact noted, in foot pounds of energy of the hammer, which would produce a very slight dent, a slight dent, a medium dent, a severe dent, etc., on up to a cut.

The balls were compared for the distance which they could be driven, by determining their liveliness, in a manner similar to that used for com-

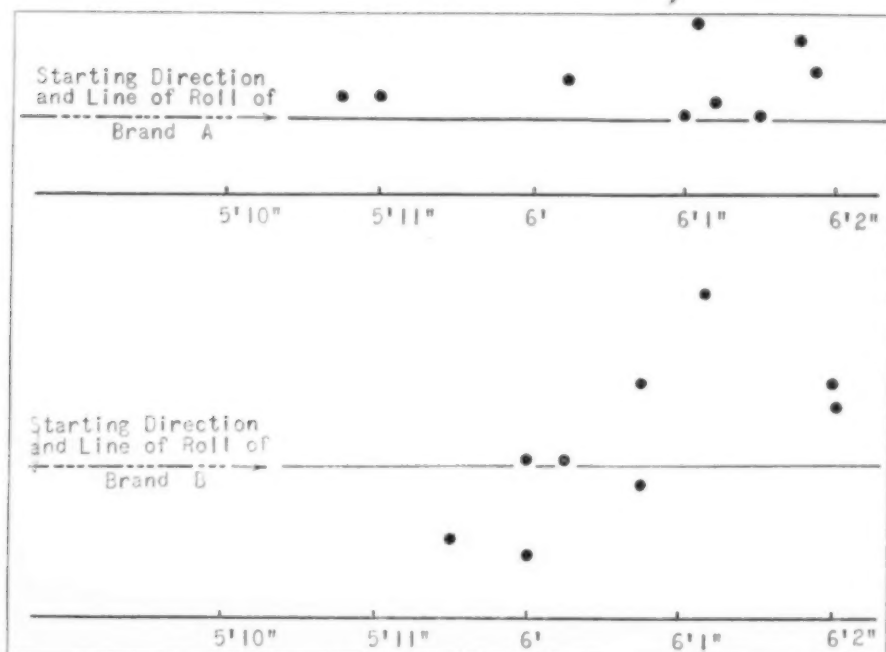


DIAGRAM SHOWING FINAL POSITIONS OF THE BALL IN NINE TRIALS, FOR AN ACCURATELY PUTTING BALL (A) AND FOR AN INACCURATELY PUTTING BALL (B).

paring the liveliness of tennis balls. The balls were dropped onto a hard surface and the rebound height measured photographically. The livelier a ball is, the higher it will bounce when dropped from a given height.

The method devised to measure the putting accuracy of a ball was to determine the uniformity of roll over a flat, ideal putting surface. Three balls of each brand were allowed to roll down a trough, of particular length and inclination, onto a short nap rug, which was brushed before each roll so that the nap lay in the direction of travel of the golf ball. The coordinates (geometrical position) of the point at which the ball came to rest after each roll were determined and plotted on coordinate paper. By this test, it was seen that some balls, which were well balanced, rolled in almost the same direction each time, while others would deviate more to one side or the other. To illustrate this, a diagram is reproduced showing the actual test results for two balls, one an accurate putting ball, the other a less accurate one. Note that the departure from the original straight line in which the ball was rolling is much greater for one ball than for the other.

The most important, and only consistent, difference found between a good low-priced and a good high-priced ball was the obvious one of price. No difference revealed by carefully conducted test measurements would indicate that the higher-priced ball would have longer life or would be likely to give the golfer a lower score than the low-priced ball, in general. In fact, a thirty-five-cent ball was one of the best of all tested for distance, accuracy of putting, and durability of cover. And there was perhaps unconscious humor in the fact that it had the *Geer* patented cover "which due to the cost of manufacture," according to an advertisement of another brand, "can be provided only on balls selling at 50c or more." A much-advertised dollar ball, on the other hand, which was claimed to have a thin cover "as tough

as the toughest" was found by test to have a cover which was the weakest in resisting hard use.

A. Recommended

- Airway* (Crawford Macgregor & Canby Co., Dayton, Ohio) 35c. Medium-hard rubber center. Good durability. 1
- Medalist* "Clipper," Cat. No. 860—4167 (Distrib. Montgomery Ward & Co.) 35c plus postage. Soft rubber center. Had *Geer* patented cover. Good for distance, accuracy of putting, and durability. 1
- Peau Doux* (Distrib. Walgreen Drug Stores) 21c. Medium-hard rubber center. Average for distance and putting accuracy. Good durability. 1
- North British 50* (North British Rubber Co., Ltd., Castle Mills, Edinburgh) 50c. Liquid center. Excellent durability and putting accuracy. 2
- Hol-Hi K28* (Wilson Sporting Goods Co., Chicago) 75c. Liquid center. 3
- Royal Blue* (U. S. Rubber Products, Inc., Passaic, N. J.) 75c. Liquid center. Had *Geer* patented cover. 3
- Silver King* (Distrib. John Wanamaker, Inc., Philadelphia) 75c. Liquid center. Good durability. 3

B. Intermediate

- Aristo*, Cat. No. 6—910 (Distrib. Sears, Roebuck & Co.) 3 for \$1.10 plus postage. Liquid center. 1
- Olympic* (A. G. Spalding & Bros., 105 Nassau St., N.Y.C.) 35c. Medium-hard rubber center. Good for distance. 1

C. Not Recommended

- Canny Scot* (Golf Ball, Inc., Chicago) 25c. Hard rubber center. Ranked twelfth (last) in test for distance. Next to the weakest in impact test for resistance of the cover to hard use. 1
- Hagen Vulcord* (The L. A. Young Golf Co., Detroit) 75c. Liquid center. Eleventh (next to last) in test for distance. 3
- Penfold* (Penfold Golf Balls, Inc., N.Y.C.) \$1. Liquid center. Advertised "as tough as the toughest" and a "championship ball . . . so tough that every golfer, good or indifferent, can play it economically"; was found, however, to rank last among twelve in the impact test for resistance of the cover to hard use. 3



YOU PAY YOUR MONEY AND MAKE YOUR CHOICE INTELLIGENTLY WHEN CANNED GOODS ARE CLEARLY GRADED A B C.

WHAT'S IN THE CAN?

Fancy, Choice, or Standard Fruits and Vegetables

SUPERFINE," "Extra Fancy," "Supreme Quality," "Nature's Finest," and other super-superlative claims appear on the countless brands of canned fruits and vegetables on the grocery store shelf. No doubt the average housewife has become so accustomed to such exaggerations that she buys her canned peas on the basis of previous experience, or CR's recommendations, or whenever possible, purchases fresh peas which she can inspect at first hand.

How much simpler the problem of purchasing canned goods would be if each can were labeled first, second, third, or fourth grade; or A, B, C, and substandard, which is the equivalent of the system of grading by the Bureau of Agricultural Economics used by bankers and brokers who lend money on stocks of canned goods in warehouses. The wholesaler buys his stock on the basis of such grades. But when the can of peas, tomatoes, corn, or peaches is sold to the housewife over the counter, she is expected to buy a particular brand because it is advertised in a well known woman's magazine, recommended by *Good Housekeeping Institute*, featured in a newspaper cooking school class, or just because it has a pretty picture on the label.

Let us look for a minute at some of these labels. For several years, CR has had a large number of brands of canned fruits and vegetables graded by a government grading station. The labels are first removed and the various brands are given a code number, which is their only identification to the graders. A sample of *Pi-na-st* Fancy Quality Golden Bantam Corn, in spite of its name, was found to be government third grade. *Stokely's Finest* Solid Pack Tomatoes, which carried *Good Housekeeping* Seal of Approval, was government substandard (one grade lower than third). Although one of the *Del Monte* products received an A rating on the basis of government grading, the sample of *Del Monte* Florida Grapefruit was rated third grade. The company which markets this brand is a heavy advertiser; obviously it is more profitable to talk about *Del Monte* quality than

to be required to give enough information on the label to inform the housewife that some *Del Monte* products are third grade.

What information do you want when you buy a can of peaches? Paul M. Williams, Senior Marketing Specialist of the Bureau of Agricultural Economics, recommends:

1. A truthful, concise statement of grade in such terms as "Grade A," "Grade B," and "Grade C."
2. Such additional descriptive information as may be appropriate for the product, such as count of pieces as in the case of peaches, sieve size as in the case of peas, strength of sirup in the case of fruit, number of servings, etc.

At the present time the only large distributor of canned goods which puts the government A, B, C grades on labels is the A & P. Do you know what the different government grades signify? Let us turn again to one of Mr. Williams' speeches for an official explanation:

Grade C canned food is good wholesome food. In this grade, a large percentage of all canned foods is found. The raw products used in this grade may not be so carefully selected as to size, color, and maturity as in the higher grades. Products of this grade should sell at a cheaper price than products of higher grades, but in the case of many commodities the food is just as nutritious. In grade B will be found vegetables that are more succulent than those in Grade C, and the fruit is better selected as to color, size, and maturity. Consumers will find that products of this grade will be very satisfactory for general household purposes. Only the finest products are found in Grade A merchandise. The fruits and vegetables are very carefully selected as to size, color, and maturity. Incidentally, not a large proportion of canned products are fitted for this grade.

Consumers who want concise accurate information about the brands available in their locality which are not included in CR's test should urge their congressmen and senators to see that a provision is included in any forthcoming revision of

the Food and Drugs Act requiring all canners to put the government grades on their labels, and whenever this is not done, to label them as *ungraded* canned products. Consumers will then do the rest, and buy graded fruits and vegetables whenever they pay average or high prices for canned goods purchases. Possibly some such action can be accomplished more effectively by securing passage in your own state of an effective State Food and Drugs Act. The various attempts to get decent federal legislation enacted in this field have been pretty well riddled by politics and sunk by such a complex system of lobbying and crossfire of misrepresentation that if and when a federal statute is now enacted, it will be of little use to consumers, and may very likely leave the food and drug situation, from the consumer's point of view, more disadvantageous and confused, even, than it is now.

Each year CR has several hundred brands of canned fruits and vegetables graded by the government grading station. The majority of this year's tests are reported in the *Annual Cumulative Bulletin* (available only to subscribers to the \$3 service). The report on the brands following however, were received too late for inclusion in that issue and are to be considered as supplementing the information in it on the subject.

The brands rated *A* were government first grade except as noted. All ratings are g 37.

Fruits

A. Recommended

Del Monte (California Packing Corp.)

De Luxe Plums. Packed in extra heavy syrup (heavy syrup not desirable from the consumer's point of view).

Fi-na-st (Distrib. First National Stores, Inc., Boston)

Fancy Quality Apple Sauce.

Fancy Quality Whole Section Grapefruit.

Sliced Peaches. Packed in extra heavy syrup (heavy syrup not desirable from the consumer's point of view). Failed to meet drained weight requirement.

Vacuum Packed Sliced Hawaiian Pineapple. Packed in extra heavy syrup (heavy syrup not desirable from the consumer's point of view).

Geneva (Geneva Preserving Co., Geneva, N. Y.)

Red Sour Pitted Cherries.

Iris (Distrib. Haas, Baruch & Co., Los Angeles)

Fancy Ripe Whole Peeled Apricots. Failed to meet drained weight requirement.

Fancy Sliced Hawaiian Pineapple. Packed in extra heavy syrup (heavy syrup not desirable from the consumer's point of view).

Little Rhody (Distrib. Providence Public Market Co., Providence, R. I.)

Peaches (halves). Packed in extra heavy syrup (heavy syrup not desirable from the consumer's point of view). Failed to meet drained weight requirement.

Bartlett Pears. Failed to meet drained weight requirement.

Stokely's Finest (Stokely Bros. & Co., Inc., Indianapolis)

Bartlett Pears (halves). Was govt. second grade with a high score.

B. Intermediate

Fi-na-st (Distrib. First National Stores, Inc.)

Bartlett Pears.

Iona (Distrib. The Great Atlantic & Pacific Tea Co.)

Sliced Hawaiian Pineapple.

Iris (Distrib. Haas, Baruch & Co.)

Fancy Apple Sauce. Mislabeled.

Stokely's Finest (Stokely Bros. & Co., Inc.)

Whole Apricots. Failed to meet drained weight requirement.

Yellow Cling Peaches.

C. Not Recommended

Del Monte Florida Grapefruit. Pieces broken and not uniform in size. Flavor poor.

Glorietta Ripe Elberta Freestone Peaches. Packed in extra heavy syrup (heavy syrup not desirable from the consumer's point of view). Character of fruit poor, many defects.

Vegetables

A. Recommended

Diamond A (Eugene Fruit Growers Assn., Eugene, Oregon)

Dark Red Kidney Beans.

Fi-na-st (Distrib. First National Stores, Inc., Boston)

All Green Asparagus. Failed to meet drained weight requirement.

Oven Baked Red Kidney Beans.

Oven Baked California Pea Beans.

Stringless Refugee Beans.

Fancy Quality Tiny Sifted Sweet Peas.



THE CLAIMS OF THIS *DEL MONTE* ADVERTISEMENT ARE AT VARIANCE WITH CR'S FINDINGS.

A. Recommended (contd.)

- Gebhardt's* (Gebhardt Chili Powder Co., San Antonio, Texas)
Spiced Beans Genuine Chili Frijoles.
Geneva (Geneva Preserving Co., Geneva, N. Y.)
Fancy Tiny Green Lima Beans.
Shoestring Carrots.
Iris (Distrib. Haas, Baruch & Co., Los Angeles)
Fancy Cut Stringless Beans.
Libby's (Libby, McNeill & Libby, Chicago)
Diced Carrots. Failed to meet drained weight requirement.
Little Rhody (Distrib. Providence Public Market Co. Providence, R. I.)
Peas. 2 sieve.
String Beans.
Masterpiece (California Sanitary Co., Ltd., Los Angeles)
California Spinach.
Phillips Delicious (Phillips Packing Co., Inc., Cambridge, Md.)
Red Kidney Beans.

B. Intermediate

- Diamond State* (Distrib. H. P. Cannon & Son, Inc., Bridgeville, Del.)
All Green Asparagus.
Small Tender Extra Sifted June Peas. Was govt. second grade with a high score.
Fi-na-st (Distrib. First National Stores, Inc.)
Fancy Quality Small Whole Beets. Was govt. second grade with a high score.
Fancy Quality Diced Carrots. Was govt. second grade—not fancy quality.
Whole Kernel Golden Bantam Corn. Was slightly low in drained weight.
Geneva (Geneva Preserving Co.)
Extra Small Beets.
Golden Bantam Corn Cream Style.
Country Gentlemen Corn (cream style).
Whole Grain Corn (white).
Iris (Distrib. Haas, Baruch & Co.)
Fancy Sweet Telephone Peas. Mislabeled.
Little Rhody (Distrib. Providence Public Market Co.)
Peas, 3 sieve and 5 sieve.
Masterpiece (California Sanitary Co., Ltd., Los Angeles)
California Red Beans. Consistency, flavor, and texture only fair.
Selected Hand Packed Tomatoes.
McGrath's (McGrath Co., Baltimore)
Champion Diced Carrots. Failed to meet drained weight requirement.
Sacramento (Bercut Richards Packing Co., Sacramento, Calif.)
California Asparagus.
Stokely's Finest (Stokely Bros. & Co., Inc., Indianapolis)
Medium Whole Beets.

C. Not Recommended

- Fi-na-st* Fancy Quality Golden Bantam Corn. Was govt. third grade. Note mislabeling.
Little Rhody Tomatoes. Color and flavor poor.
Stokely's Finest Solid Pack Tomatoes. Carried *Good Housekeeping* Seal of Approval. Was govt. standard because of very low drained weight.
Webster's Select Quality Lima Beans. Too mature, not uniform in size, and had defects.

VACUUM OR "THERMOS" BOTTLES

UNLESS PURCHASING is done on the basis of tests, the consumer takes his chances in the selection even of so ordinary an article as a vacuum bottle for keeping hot liquids hot and cold liquids cold. There is no way of telling from outward appearances which brand will give the best service, and, as CR has found with a host of other articles, price (though the price range of the particular bottles chosen for test was not large in this instance),¹ turns out to be no indication at all of quality. The quality of a vacuum bottle depends primarily on the insulating properties of an evacuated space between two thin walls of glass, which are coated with a very thin film of silver to reduce heat losses and gains by radiation. Some of the glass bottles may be evacuated to a higher degree or silvered better than others, so giving a more perfect insulation. To test a vacuum bottle, one may take the temperature of a liquid introduced into the bottle at a known high temperature, say the boiling point, at regular intervals over a period of time as it cools off. A pint size vacuum bottle priced at about \$1 should keep liquids, originally at or near the boiling point, at temperatures above 55°C (131°F) for a period of not less than twenty-four hours. Some bottles will do much better than this.

With one exception, the nine brands of vacuum bottles tested by CR were constructed so as to permit disassembly of the entire unit. The principal parts of each bottle are a metal casing (commonly of tin-plate), the double-walled insulating glass container (filler), the shock absorber or pad which cushions or supports the filler, the threaded shoulder which fits over the neck of the filler and screws onto the casing, the rubber sealing ring, the cork stopper, and the screw-on cover. If the bottle lacks the rubber ring around the neck of the filler and under the threaded shoulder, liquids will seep into the casing and rust it, and the parts inside will become moist and moldy and may contaminate the contents of the bottle later on when it is used again. A screw-top made of a plastic material resembling bakelite has the advantage of being a better heat insulator and of being more satisfactory as a cup when used with hot fluids, but such composition caps may very likely become brittle with age, and then easily crack. Many have in fact given this trouble. Vacuum bottles are most often provided with aluminum tops. These soil the fingers of the user with a gray, greasy smudge, after the manner of the aluminum trays often used in cafeterias. The most satisfactory top of those commonly furnished would seem to be one of nickel-plated brass, and the extra cost of furnishing such a cap instead of one of sheet aluminum would be very small indeed.

¹Expensive bottles may be bought, which provide fine outer casings. The heat-retaining property of the bottle, however, is almost wholly determined by the double-walled glass flask, or filler, and may be as good for a cheap bottle as for the most expensive ones.

In filling a vacuum bottle, if several hours storage of the contents before use is to be expected, it should be rinsed with very hot water before filling with a hot liquid, and with ice-cold water before filling with a cold liquid. Liquids that are to be kept hot should be as hot as possible when poured in. With bottles that do not have a tight seal between the casing and the vacuum container, take care not to let liquids overflow and leak into the space between the casing and the container proper.

Manufacturers recommend warm water with a bicarbonate of soda (baking soda) solution for cleaning a vacuum bottle. Occasionally disassemble the bottle and inspect and clean all its parts. It is necessary, of course, to handle the double-walled thin glass container rather carefully as it is easily broken. The cork should occasionally be sterilized by boiling.

The tested bottles listed are all pint size, and rated chiefly on their ability to retain heat in a liquid introduced into the bottle at the boiling point. Differences, either in construction or performance, between the bottles rated *A* were of little significance. Bottles rated *B* were less effective than the bottles rated *A* in maintaining the temperature of the contents, but were judged, nevertheless, to be satisfactory for general use, and there would for most people be little reason for going to much trouble to obtain a bottle rated *A* in preference to one rated *B*. Ratings are cr 37 except as noted.

A. Recommended

- Keapsit*, No. 2266 (Keapsit Division, The American Thermos Bottle Co., Norwich, Conn.) 79c.
Sta-Rite, Cat. No. 6 D 7326 (Distrib. Sears, Roebuck & Co.) 69c plus postage.
Thermos, No. 7 (The American Thermos Bottle Co.) 98c.
Thermos, No. 36 (The American Thermos Bottle Co.) 98c.
Wards, Cat. No. 60 C 8109 (Distrib. Montgomery Ward & Co.) 75c plus postage.

B. Intermediate

- Columbia* (Landers, Frary & Clark, New Britain, Conn.) \$1.
Handy Andy (Distrib. Handy Andy Specialty Co., Long Island City, N.Y.) 69c. Made in Japan. Only bottle tested provided with nickel-plated brass cover (desirable). One sample less efficient than another.
Icy-Hot, No. 2208 (Icy-Hot Division, The American Thermos Bottle Co.) 79c.

C. Not Recommended

- Aladdin*, No. 10, *Sani-Sealed* (Aladdin Industries, Inc., 609 W. Lake St., Chicago) \$1. "Sani-Sealed," parts supposedly sealed; desirable if effective. Container not replaceable. One of two samples was found not to be effectively sealed.
Stanley (Stanley Insulating Co., Great Barrington, Mass.; distrib. Landers, Frary & Clark) \$4.46. Bottle "guaranteed unbreakable"; used porcelain-enamel-lined steel instead of glass container. Metal casing and metal cap. Bottle unduly heavy. Heat loss or gain varied greatly from one bottle to another. cr 32

FLASHLIGHTS

FLASHLIGHTS are in that important category of articles used by consumers which one is likely to think are fairly unimportant—until something goes wrong. When that happens one begins to take an interest in mechanical and electrical details and is likely to wish that he had considered them at the counter of the hardware store—rather than a mile from camp at nightfall in the Adirondack wilderness. For the reader who realizes that little things like flashlights may be important and that even the minor details of construction may have their great significance at times, CR presents the following study of flashlight qualities and design.

There are two main types of flashlights, which for convenience will be referred to as the tubular type and the lantern type. The tubular type, characterized by its long cylindrical shape, is more common. Its form and switch arrangement are such that it can be held and operated easily with one hand. The lantern type, in which the light hangs from a bail or handle, is rapidly gaining in popularity; it can be suspended by its handle from a nail, for example, or set down upon its base. In some of the best designs, the lantern type has two bulbs, either of which may be operated at will by throwing the switch; this is a very

desirable feature, as failure of a flashlight at a time when it is badly needed is common, and a spare bulb even if one is at hand, is difficult to install in the dark. Flashlight batteries usually give warning of impending failure by gradually weakening illumination and will often to some extent revive after being allowed to rest for a time. On the other hand, bulb failure is a more serious problem with flashlights because a bulb after an hour or two of use will often go out suddenly—forever. For general usefulness, where a flashlight is used regularly or frequently around a country house or on a farm, we suggest a lantern-type flashlight having two bulbs; the arrangement is usually such that one bulb gives a spotlight and the other a broad or unfocused light. This double bulb arrangement assures that one will not be left in the dark on a starless night in the hill pasture a half-mile, and two barb-wire fences, away from the house. A cheap tubular flashlight using a "crystal"-type bulb (a solid sphere of glass fused upon the base holding the filament, which serves to concentrate the light without the use of a reflector) may be sufficient for emergencies, such as replacing a burned-out fuse at home or locating trouble in an automobile; however, lamp burn-outs and batteries going down sud-

denly are so common that one is inclined to suggest that whenever a cheap or one-bulb flashlight is used there ought to be another one available, or spare batteries and bulbs, at least, kept in a convenient and quickly accessible place.

Metal-case flashlights have some disadvantages but, in view of their being lower in price than fiber-case flashlights, can be recommended for most uses.

A 2.5-volt bulb, operated with two size-D cells (each cell $1\frac{1}{4}$ inches in diameter by $2\frac{1}{4}$ inches long) in series, gives sufficient light for most purposes, so that three or more cells may, according to present information, be considered a luxury at increased operating cost (an important item, as energy from flashlight batteries costs in the neighborhood of \$15 to \$30 per kilowatt-hour—as against about 5 cents per kilowatt-hour, which is the average price paid in the United States for electrical energy from electrical central stations.

An investigation carried out for CR showed that for a given amount of current used by the bulb, the cost per hour for operation of a flashlight increases approximately in proportion to the number of cells employed, while the amount of light produced increases at a slightly greater rate (so

that the cost *per unit* of light output becomes less with the larger number of cells). Wherever the greater intensity of light is not actually needed, therefore, it will be most economical to use not more than two cells.

For most ordinary purposes, strong light is not particularly necessary. (For information on economically obtaining increased light output, see *Flashlight Bulbs*.)

The use of flashlights containing more than two cells connected in series is not safe near inflammable gases or vapors, e. g., gasoline, because of danger of ignition by sparking at the switch; in addition, and regardless of the number of cells, the incandescent bulbs should be protected by glass covers when used in work near inflammable gases or vapors, to give at least a minimum degree of protection against explosion in the event of accidental breakage of the bulb. Small-size flashlights, e. g., the fountain-pen type, which use one or more cells smaller than size D and bulbs less than 2.5 volts, are never economical to operate compared with larger flashlights and should be chosen only in cases where very small size is of first importance, and life and dependability in emergency are not essential.

The following are some of the undesirable features which signalize a flashlight as being of poor construction or design. Glass covers or

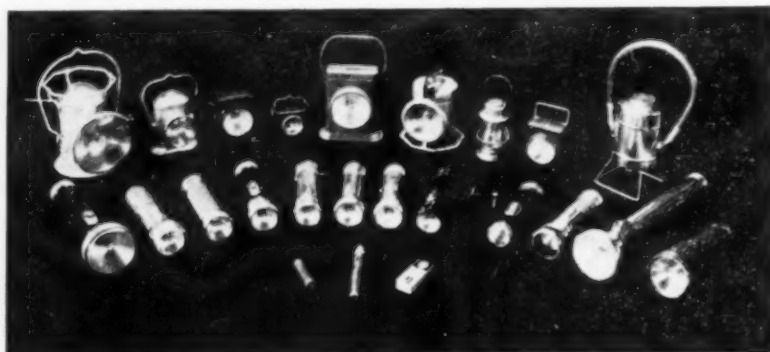
lenses are often unpolished, or are foggy, or contain air bubbles which decrease the amount of useful light; this defect, when it is in evidence, is usually easily to be determined by inspection. It is believed that nowadays no good flashlights use a bulging (convex) lens, though this method of obtaining a focused beam was common some years ago. Electrical energy supplied through flashlight batteries is far too expensive to waste either by poor transmission of light through the glass or poor reflection by a matt-surface unpolished mirror used as a reflector in many of the cheaper lights. The mirror of a first-rate flashlight has a surface which is very bright and free from scratches and irregularities of all kinds. With many flashlight mirrors, the bright spot which is projected onto a white surface (this we may call the light image test) may have a strongly marked dark center. This is a decidedly disadvantageous feature in many uses. The extent of the defect

is easy to note by holding the lighted flashlamp about three feet from a plain white surface, and in doing this in a dark or dimly lighted room, it is very easy to compare the quality of any number of flashlights and to distinguish the good ones from the bad. In making the test, however,

it is important that fresh batteries be used in each case and that the bulb be of the right voltage and type for the particular flashlight which is being tested.

Sometimes the switch is of poor electrical design, causing poor or unsteady contact. This may be detected in the most obvious cases by trying the switch in various positions. All too many flashlights have switch units which are weak and flimsy and one may be sure that a flashlight with a switch which is tinny in construction will not last long under any sort of hard use. Sometimes bad contact will be made by unscrewing the cap one turn or a fraction of a turn, and in that case, the light may flicker or even fail completely. A good flashlight will not be extinguished in one position of the cap or base and on in another after these parts have been screwed in sufficiently to make proper contact between the lamp, the cells, and the part of the casing with which these are designed to make contact.

In many flashlights there are several pieces to fall apart when the cover at the lamp end is taken off, and the glass disk is then easily broken. A well-designed flashlight is constructed in units or sub-assemblies, reducing the number of loose parts to a minimum, and making it possible to take the flashlight apart without running the risk of breaking the disk or cover-glass or lamp on a concrete floor



SOME OF THE VARIOUS TYPES OF FLASHLIGHTS TESTED

or sidewalk. In some flashlights the method of holding the glass disk and reflector is not independent of the focusing, with the result that these parts are securely held only when they are focused at one end of the focusing range—which means that the focusing arrangement is rendered more or less useless or ineffective.

A well-made spring-motor-driven-generator type (non-battery) flashlight would be a very valuable appliance and many would be glad to own such a device if its mechanical and electrical design would give promise of many years of useful life. On present information, such spring-motor-driven flashlights do not warrant recommendation, and it is doubtful if one would be getting a satisfactory article of this type even if the high price often asked is paid. Flashlight "models" are continually and needlessly changed to stimulate sales. On this account, any list of brands will have only temporary validity. The consumer should therefore familiarize himself with the above points and test them out by closely examining various flashlights which come into his hands.

In case a subscriber decides to buy a flashlight which is not listed later in this report, he will do well to examine it critically for the various points which have been discussed in the paragraphs preceding the listings.

The flashlights listed are rated primarily on the basis of the above considerations. Mechanical construction is often so bad and so variable that there would be little use in carrying on efficiency tests. The less satisfactory or very unsatisfactory flashlights are in the present market very easily distinguished from the better ones, and even the better ones are with rare exceptions far from being as good as they might easily be.

A. Recommended

- Delta Buddy Flashlight Lantern* (Delta Electric Co., Marion, Ind.) \$1.25 without batteries; 1 bulb. 2
Delta Juniorlite (Delta Electric Co.) \$1.39 without batteries. A well-made, strong, convenient, lantern-type flashlight with 2 bulbs; controlled by a two-way switch; both bulbs protected by glass covers; 2 size-D cells. 2
Delta Powerlite (Delta Electric Co.) \$3.35 without batteries. Similar to *Delta Juniorlite* but larger. Used 6-volt lantern battery (or 4 size-D cells in adapter, available for 50c extra). 3

B. Intermediate

The first seven flashlights of the following appear, on present evidence, to be first-rate in the field of low-and medium-priced flashlights but have not yet been subjected to sufficiently long use to permit final rating. Some of them, perhaps, would receive an A rating after being subjected to longer tests in practical use.

- Burgess F29* (Burgess Battery Co., 202 E. 44 St., N.Y.C.) 75c complete. In general, good construction for a cheap flashlight. 2-cell focusing type. 1
Eveready, No. 251 (National Carbon Co., Inc.) 45c without batteries. 2-cell focusing type. 1
Eveready, No. 42, Automobile Flashlight & Holder (National Carbon Co., Inc., N.Y.C.) 79c complete. Reflector not well polished. 2-cell focusing type. 1
Ranger Spotlight (Scovill Mfg. Co., Waterbury, Conn.

B. Intermediate (contd.)

- distrib. J. J. Newberry Co. stores) 59c without batteries. 2-cell focusing type. 1
Winchester, No. 5811 (Winchester Repeating Arms Co., New Haven, Conn.) 49c complete. 2-cell focusing type. 1
Ranger Searchlight (Scovill Mfg. Co.) 85c without batteries. 3-cell focusing type. 2
Zephyrlite (Scovill Mfg. Co.) 89c without batteries. 2-cell focusing type. 2

* * *

- Challenge*, Cat. No. 20—1371 (Distrib. Sears, Roebuck & Co.) 29c complete plus postage. 2-cell focusing type; a fairly well-made flashlight at a low price. 1
Niagara Bearcat, No. 24 (Niagara Searchlight Co., Niagara Falls, N.Y.) 79c without batteries. Fairly well-made lantern with 1 bulb and large focusing reflector; worked with either 2 or 4 size-D cells. There was space inside to carry a spare bulb but replacement would be rather difficult in the dark. 1
Delta Wildcat (Delta Electric Co.) \$1.69 without batteries. A well-made lantern-type lamp with 2 bulbs, but with neither protected by glass cover; worked on 2 or 4 size-D cells. Switch in inconvenient position requiring both hands to operate lamp; would have rated A except for this defect in design. 2
Official Boy Scout Lantern (Bond Electric Corp., New Haven, Conn.) \$1.25 complete. A rather well-made lantern-type lamp with only 1 bulb; 2 size-D cells. Space inside lamp for an extra bulb that may be inserted without much trouble. The sample bought by CR developed poor electrical connections so that light flickered in use. 2
Winchester, No. 6711 (Winchester Repeating Arms Co.) \$1 complete. Somewhat "trappy" construction. 2

C. Not Recommended

- Bond "Lantern"* (Bond Electric Corp.) 29c complete. Made to imitate the old-style kerosene lantern; used 1 size-C cell. Had a flimsy handle or bail that was supposed to act as a switch but did not. The efficiency of the poor quality glass globe was lessened, in so far as obtaining useful light is concerned, by a number of thick glass ridges. An exceptionally impracticable device. 1
Bond, No. 2222 (Bond Electric Corp.) 59c complete. 1
Eveready, No. 2604 (National Carbon Co., Inc.) 75c less batteries. Gave poor light image or beam; switch somewhat difficult to operate. 1
Eveready, No. 6 (National Carbon Co., Inc.) 50c complete. A handy, small-size pocket lamp using 2 size-C cells and a 2.5-volt crystal-type bulb. Very poor insulation produced short-circuiting of the batteries. 1
Usalite (U. S. Electric Mfg. Corp.) 50c without batteries. Formerly a fair flashlight, lately rather inferior in quality. Gave poor light image. 1
Eveready Official Boy Scout (National Carbon Co., Inc.) \$1.50 complete. Had belt clip for carrying; ineffective on this type flashlight when wearer stoops or crouches. Gave poor light image. 2
Lighthouse. \$1.50 complete. Poor light image; poor plating on reflector of 1 of the 2 lamps tested. 2
Usalite Red-Head (U. S. Electric Mfg. Corp.) \$1.25 complete. 2
Motor Dynamo No-Battery (Campbell Mfg. Co.) \$5 with extra bulb. Operated by a small spring-driven dynamo.

C. Not Recommended (contd.)

Weight was excessive, 2 lb 10 oz; gave meager light output; motor inconvenient to wind; required a special type bulb, priced by manufacturer at 25c. Mechanism soon functioned badly. 3

Sun-Light, No. 9402, Railroad Lantern (so called), Cat. No. 86—4729 (Blake Mfg. Co.; distrib. Montgomery Ward & Co.) \$2.19 complete plus postage. Design and construction faulty in several respects; lacked reflector that should be present in lamp of this size and price if to be used for other than signaling purposes; interior corroded badly after short period of use. 3

Flashlight Batteries

In a 1934 test on ten different brands of size-D ($1\frac{1}{4}$ inches in diameter) batteries, three makes were found to have about twice the life of three others. The superior makes were: *Best*, *Merit*, and *Aladdin*. *Sears*, *Roebuck Shurlite*, and the *Eveready* were found *Intermediate*. *Arrow* (distrib. J. G. McCrory Co.), *Royal* (distrib. S. S. Kresge Co.), and *Wards Standard Quality* (distrib. Montgomery Ward & Co.) were rated least satisfactory.

Flashlight Bulbs

The average life of a 2.5-volt flashlight bulb (rated 14 hours at normal voltage) was found to be about 45 minutes when tested at 3 volts (the voltage of two nearly new standard size-D cells). Japanese bulbs were found to give less light and to be less uniform in life than *Mazda* bulbs but had on the average about the same active life. Where Japanese and *Mazda* bulbs are the same price, *Mazda* bulbs were found preferable, but where Japanese bulbs are 5 cents and *Mazda* bulbs 10 cents, it was found somewhat more economical to use Japanese bulbs. Don't buy crystal-type bulbs for reflector-type flashlights (except when reflector has become corroded); crystal bulbs are somewhat inferior to plain bulbs in amount of light produced.

The *Mazda* crystal bulbs produced a smaller but more intense beam than the Japanese crystal bulbs.

The average use of a flashlight is probably such (less than $\frac{1}{2}$ hour total per month) that the consumption of energy from the battery by the bulb is an almost negligible factor in influencing the life of the battery, as compared with its own self-deterioration which goes on through chemical actions taking place inside the cells. Consequently, if the consumption of energy is increased somewhat by using a bulb which takes more current, the increased light is obtained at practically no additional battery cost, and only a slight additional cost for the bulb. Where a flashlight is used more than $\frac{1}{2}$ hour per month, best economy will be obtained by using the No. 14 bulb. If a strong light is needed, use the No. 31, 0.3 ampere, 6-volt bulb with a 5-cell flashlight, at a considerably increased cost per hour. A further increase of approximately 65 percent in light output may, at negligible increase in cost when used less than $\frac{1}{2}$ hour per month, be obtained by employing the No. 605, 0.5 ampere,

6-volt bulb, with a 5-cell flashlight.

Some difficulty will probably be experienced in identifying bulbs in retail stores either by *Mazda* number or by current rating. It has apparently never occurred to the hardware and "variety-chain" trade, or the jobbers who supply them, carefully and fully to identify bulbs in relation to the reflectors and number of cells with which they should be used. It would be very easy to adopt a simple and easily seen marking for bulbs that would make an incorrect selection impossible. (Choosing the wrong bulb may have the most serious effect on the efficiency or usefulness of the flashlight or the length of life of bulb and batteries.) Low-priced bulbs are identified only by the color of the bead and "are not guaranteed for focusing lights." Standard types, so called, which sell at a higher price, usually have their voltage rating stamped on the base, thus 3.8V; they will also have colored beads for additional identification. The following table is given to aid subscribers in identification.

<i>Mazda</i> Number	Volts	Ampere Rating	Bead Color
Low-priced types			
701	2.2	0.25	White
710	2.3	0.27	Purple
714	2.5	0.30	Blue
713	3.8	0.30	Green
Standard types			
222	2.2	0.25	
248	2.4	0.80	
14	2.5	0.30	
13	3.8	0.30	
605	6.0	0.50	
31	6.2	0.30	

ON APRIL 26, the Supreme Court of the United States upheld the constitutionality of the Maine Cosmetic Registration Law providing that all cosmetics sold in Maine must be registered and paying an annual fee of fifty cents. The court held that it is within the regulatory powers of a state to ban harmful cosmetics through such a law, and if federal legislation to include cosmetics under the food and drug law is not passed soon, it is believed that other states will follow the example of the State of Maine. ("Retailers Feel 'The Power of the Law,'" in *Druggists Circular*, July, 1937.)

Maine is to be congratulated on the successful defense of its cosmetic law against the legal attack by the cosmetic manufacturers. It is to be hoped, now that legal battle is over, that Maine will be able to take its place along with New Hampshire which has done such excellent work in protecting consumers against harmful and potentially harmful cosmetics. Other states will do well to emulate their example.

RADIO TODAY

With Some Notes on What It Might Be Tomorrow

WITH GREAT enthusiasm: "We have a switch to turn it off." Thus spoke a representative of a radio manufacturer, of the system of automatic frequency control in his receiver. When asked why, then, the automatic frequency control system was there at all, he replied, "The public demands it."

This article is written for those in the radio purchasing public who want above all else that quality in a radio set which salesmen consider a matter of small importance to the public, namely, a satisfactory degree of faithfulness of reproduction. It is my impression that a large number of CR subscribers are such people.

Let us state our requirements of a satisfactory radio receiver: (1) It should reproduce speech and music with as much realism as the present state of the art will permit. (2) It should be easy to operate. (3) It should be built of parts of good quality that will give promise of lasting, free from service difficulties, for a number of years. (4) It should be free from unnecessary circuit complications.

It might be in order at this point to explain fully what faithful reproduction is. Music and speech consist of many tones and overtones over the entire range of audibility which runs from the lowest organ note of about thirty cycles per second to eight or ten thousand cycles. The very high frequencies give some of the distinguishing characteristics of certain instruments of the orchestra, such as the oboe, the triangle, the cymbals. The ideal of true reproduction is to reproduce all of these tones and overtones with their original emphasis. This ideal has not yet been reached but a much closer approximation to it than is now to be had can be made available, and would indeed long since have been made available, in one or two makes and models at least, if manufacturers had not been chasing far different ideals. As I shall show by example, many of the recent "improvements" in radio make the approach to this ideal very much more difficult than it should be.

The first and third of the points enumerated above are, of course, of greatest importance. If the fourth is not fulfilled, the first will not long be maintained, tubes, resistors, condensers, and transformers being what they are.

The first point is the most difficult to evaluate, for the strong tendency of the listener is to compare the tone of the receiver under demonstration to other *radio sets* he has heard, instead of comparing it to actual *concerts* he has heard. Announcers' voices should be listened to very attentively, for most radio purchasers, particularly those who do not give great attention to the details of musical renditions, are more familiar with the human voice than with any musical instrument?

It is apparent to any trained ear that these requirements are not met in current models, although there seems to be of late something of a trend in the right direction in the middle price range. It is a curious fact, but true, that many of the high-priced receivers of six and seven years ago gave distinctly more creditable performance than the recent models in respect to this factor of faithfulness of reproduction. To understand in some measure how this strange situation has come to be, let us return to the manufacturer mentioned in the first paragraph of this article.

The company in question is probably the most reliable in the industry. It has made its errors of design, but those were the errors arising from the state of the art at that particular time. It has never to my knowledge used a questionable circuit development until the advertising of its competitors forced it to do so. I know that for many years it made every effort to teach the public the truth about radio "improvements" and in so doing lost business. Its salesmen were provided with ably written bulletins explaining how harmful various "improvements" were.

Let us take a specific example. When some bright lad in some bright factory thought of putting into radios a simple control (tone control) to make inaudible even more of the high-frequency range than was normally lost in the maze of circuits which the set included, the company of which we are speaking refused to use this device for degrading the reproduction, justifying its position by explaining in detail that such a control was essentially a device for distorting, not improving, the music. Meanwhile, the public was being "educated" through advertising campaigns of much more elaborate and less scrupulous character. Visitors to the showrooms would say, "What? No tone control?" and walk out. So, to stay in business, that manufacturer *had to* equip his receivers with tone controls.

This took place time after time as other "improvements" came to the fore. It is still taking place, in respect to one gadget after another, in sets of all makes. This year the particular aspect of gadgetry which seems to intrigue the designer is the endless elaboration and complication of dial design, all rendered plausible chiefly by the supposed desirability of covering a range of wave bands, foreign, police, and other wave bands in addition to the broadcast band.

Now we come to the question: *Why* is the public so ready to believe that such-and-such a device is an improvement rendering obsolete all receivers not possessing it? Why does it, year after year, fall for this so easily that it is now possible to palm off, as outstanding innovations, devices that were used years ago and dropped again for a time as unimportant and obsolete?

There are, I think, several answers to this question, and all are in part true. Probably first in importance is the astonishing ability of radio advertising men. Then there is the natural tendency to believe that anything new is worth while. The consumer is naturally trusting; he can hardly imagine that advertising men would write such whoppers as they do as a matter of course. If a statement is bold enough it is likely to be believed, mainly because one does not expect such falsification by a big concern, nor does one suppose that an outright misrepresentation would be printed by leading, respectable magazines. The consumer is also taken in by his own desire to be the first in the neighborhood to have a radio with a given "improvement."

But probably one of the most important factors is that each "improvement" pretends to cure a trouble or to fill a need that has been apparent for some time. Let us return to our now familiar example, the tone control. There was apparent in most receivers of that period (and we still have it) a very high response in a narrow region of tones. This was disagreeable, and the tone control did remove the unpleasant effect. That it eliminated also all the tones *higher* than the overemphasized ones the advertisers failed to mention. Also, since the low-note response at that time was weak (as it still is, in most receivers), cutting off of the "highs" by the tone control gave an improvement in general effect, by making the lack of "lows" less noticeable; giving, as it were, deficient but balanced reproduction.

Further, it is interesting to note that since the advent of the tone control, receivers have been marketed with such inferior tone quality that the use of the tone control has been almost imperative. Having given the consumer the gadget, set manufacturers have, as it were, seen to it that he would have occasion to use it. That type of distortion known as harmonic distortion makes itself felt mostly in the higher range. This type of distortion has been worse in recent years; the tone control has been an aid in apparently reducing it—by taking away both the overtones and the tones they were associated with. So the tone control has been used. The manufacturers say, "No, the public does not want natural reproduction; why, look at the way they cut off the highs with the tone control!"

That is not true. People *do* want natural reproduction of the full audible range. But, rather than hear highs that are chiefly distortion, or hash, as the experts call it, people choose to cut the highs out altogether so that what is left sounds tolerable. Were truly good high-note reproduction made available, a large part of the public would never use tone controls.

I have used the tone control as an example because it is familiar to all listeners and because its story is so similar to that of many "improvements." Now to touch upon a few of them, and through that means to see in part what is wrong with modern receivers.

It would be impossible to mention all of the many reasons why the modern radio receiver is at once a most unsatisfactory musical instrument and

a very salable device, but we can speak briefly of several. Many people remember the days of the many "dynes." The autodyne and the superheterodyne are the only circuits which survive from that era and they are indiscriminately called "superheterodyne." The arguments for and against the superheterodyne as compared to the older and simpler tuned-radio-frequency circuit are still a matter of honest discussion and need not be aired here. It is, however, true that the superheterodyne requires more service if it is to be kept in good operating condition, and that it is inherently a noisy circuit; noisy, that is, in the sense that noise is produced in the set itself, apart from that which comes in by way of the ether and the antenna. It is also true that *in some parts of the country*, mainly big city locations where there are several powerful stations, the tuned-radio-frequency receiver cannot be made sufficiently selective for local conditions without acquiring most of the disadvantages of the superheterodyne and none of its advantages.

For all listeners who are not *very* close to a powerful transmitter the tuned-radio-frequency receiver is far more desirable. The man who desires quality reproduction seldom wants to hear distant stations on bands adjacent to those used by his pet, high-quality local stations. Quality reproduction and high selectivity are incompatible, so the choice must be made, and the set manufacturer makes it, unbeknownst to the radio consumer, in such a way as to penalize everyone, all listeners in Easton and Glens Falls, for the peculiar needs or practices of the resident of metropolitan New York, Philadelphia, or Chicago.

Automatic tuning, necessarily involving automatic frequency control, which looms so large in current advertising, is an appealing end, to be sure, but the means to the end are not at all appealing. They point to much more servicing and less satisfactory performance.

Automatic volume control is very desirable in many locations, mainly in those locations where the super-heterodyne circuit is not needed or useful; yet it is with superheterodyne sets that we have been vouchsafed the advantages of automatic volume control that should have been furnished with tuned-radio-frequency circuits. But automatic volume control adds so much to the realism of a radio's performance that we should be prepared to make some small sacrifice in fidelity in order to have it. Such sacrifice must be made in current production, but receivers can be built in which the effect of automatic volume control on the quality of reproduction is negligible.

Every radio may be divided into five parts: the high-frequency amplifier, the detector, the audio amplifier, the loud speaker, and the power supply. The high-frequency amplifier amplifies high-frequency signals or "carriers" (far above the range of audibility) which "carry" the program material which we hear coming from the loud speaker. The detector tube is the connecting link between the high-frequency amplifier and the audio amplifier, and functions in a manner which need not be discussed here. The audio amplifier, as its name indicates, amplifies the electrical





HELPS FOR TEACHERS

of

CONSUMERS' PROBLEMS

Consumers' Research has much material available for teachers of courses in Consumers' Problems, Consumer Purchasing, and Economics of Consumption, courses in which are being rapidly introduced into school curricula all over the country. Various combinations, and other material that many teachers have found useful, are listed here.

CONSUMERS' DIGEST

with Teachers' Manual and Study Outline

Consumers' Digest is a new monthly magazine which presents in popular, readable fashion information of especial interest to consumers. Many of the articles and reports on commodities come from Consumers' Research *Bulletins* and from CR's books. *Consumers' Digest* lists commodities by brand name but presents only the *Recommended* list-

ings. New articles especially written for this magazine appear each month, including directions for making a consumer's test of some commodity. "Gullible's Travels," by the managing editor, J. B. Matthews, delightfully satirizes current advertising and sales techniques. Subscriptions are \$3 a year; single copies, 25c.

Special rates are made for classroom or study groups as follows:

10 to 25 copies at 20c each
25 to 100 copies at 15c each

A free copy of the magazine for the instructor and one copy of the Teachers' Manual and Study Outline are sent with each group order.

Sample copies of *Consumers' Digest* and the Teachers' Manual and Study Outline will be sent on request to teachers contemplating using the *Digest* in class.

CR's ANNUAL CUMULATIVE BULLETIN AS A TEXTBOOK

In order to make available on an economical basis a considerable part of CR's confidential material at a price within reach of student incomes, a special subscription consisting of the *Annual Cumulative Bulletin*, the *Introduction to Consumers' Research*, and several reprints such as *Testimonials C. O. D.*, *Scot Tissue*, *Gyp Row*, sent in one mailing, is available for classroom use, at \$1 per student when each member of the class subscribes.

Teachers who are interested in using this material in class should write for the special student-application blanks. Each student who will use the material must sign the special blank agreeing to keep the information confidential, before any material is issued to him. Further, every student in the class must sign the agreement before it is permissible for the instructor to discuss any information in confidential *Bulletins*.

BOOKS WRITTEN

BY **J. B. MATTHEWS**

CO-AUTHOR OF "PARTNERS IN PLUNDER"

With an Appendix by Oscar S. Cox

A limited

from

(No



This book is the CONSUMER'S MANIFESTO. It contains a summary of the manifold frauds practiced upon consumers, but it goes beyond all of the previous discussions of consumers' problems and, for the first time, makes a reasoned and integrated statement of the political and economic changes needed to bring the living standards of 125,000,000 Americans up to the level made possible by our advanced technology and our human and material resources.

In these days of sharply rising prices, which some claim are due in part to the numerous strikes all over the country and the resulting forced wage and expense increases, consumers are becoming conscious of their rights *as consumers*. Are the interests of workers and consumers identical? Would the "workers' state," which is the Utopia of some of our social theo-

GUINEA PIGS NO MORE

By J. B. Matthews

rists, concern itself with abolishing patent medicines, chemicalized bread, and other mass production food? Is not the use of lead arsenate spray on fruits and vegetables "misdirected" labor power?

These questions and many others dealing with the relationship of consumers to workers are thoughtfully discussed in this book. *Guinea Pigs No More* also discusses "Who Are Consumers?" How do the consumer's interests differ from the so-called public welfare? It is important to define very clearly the concerns of people as consumers as differentiated from their other roles in society as producer and worker.

CONSUMERS' TEST MANUAL

THIS pamphlet comprises a number of simple and readily-applied tests of common household articles and supplies, suitable for use of students of chemistry, physics, general science, and household arts. The Chemical Section, which is now ready, contains simple and concise directions for making a number of tests such as: Tests for Quantity of Water in Butter; Sulphites in Fruit, Fruit Juices, etc.; Starch in Face Powder; Lead in Paint; Ash in Coal; Quality of Eggs; and Analyses of Soap. 38 pages (including index), 50c.

FROM DATA IN CR'S FILES

*number of these books are available
Consumers' Research at \$1 the copy
Extra Charge for Postage)*

PARTNERS IN PLUNDER

By J. B. Matthews and R. E. Shallcross

A study of our present business system, the aspects which affect consumers, and what the effect of fascism in its final form and development is on consumers' standards of living. It is also an excellent source book, full of concrete examples of poison hazards, adulterants, misbranded goods, high-pressure sales tactics, and misleading advertising.

EAT, DRINK and BE WARY

By F. J. Schlink

This book discusses the factory-originated trend, now well-nigh universal, toward refined, demineralized, and devitaminized foods. This trend has been fol-

lowed by futile attempts to restore the old balance of nutritive elements that characterizes natural, unadulterated, honestly prepared foods, by putting over excessive roughage; and vitamin D bread (also factory-made), cod-liver oil, raw vegetables, and other diet quackeries. Diet fads indulged in by the poor and ignorant, and by the well-to-do and educated classes alike, are discussed. The wide propagandizing of milk as a "health food" is shown to be a triumph of big-business enterprise and subsidized science rather than a genuine discovery of unbiased, disinterested nutritional scientists.

A constructive summing-up is given of what really is known about food science, by experts who aren't hired to have particular views in favor of bran or oranges or viosterol or vitamin D milk. The author shows how and what to eat in order to avoid, as well as one can, adulterated, overrefined, and downright dangerous foods and beverages.

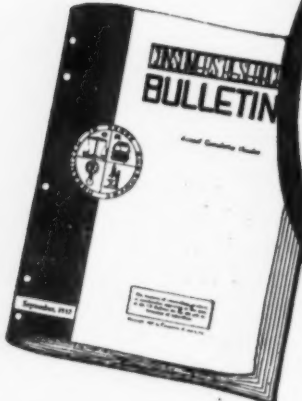
CONSUMERS' RESEARCH GENERAL BULLETIN

Consumers' Research *General Bulletin*, unlike most CR *Bulletins*, is not confidential. It is issued four times a year in October, January, April, and June. It presents results of tests on various products, listing them by brand name in the same fashion as the *Annual Cumulative Bulletin*. Since it is not confidential, school libraries may subscribe and the *General Bulletin* may be freely used as reference where an entire class does not wish to avail itself of the special offer on the *Annual Cumulative Bulletin*. Subscription rate for the volume year October through June is \$1. Subscriptions are entered for this period only.

Now ready!

CONSUMERS RESEARCH

Annual Cumulative Bulletin 1937



LET THIS HANDBOOK OF BUYING ADVISE YOU ON WHAT TO BUY TO GET THE MOST AND THE BEST FOR YOUR MONEY.

The *Annual Cumulative Bulletin* represents a fairly complete summary of the reports and tests made by and for Consumers' Research on many of the products which you use every day. Products are listed by brand name as *Recommended*, *Intermediate*, and *Not Recommended*. These listings are carefully compiled by able consultants and a skilled and expert staff under the direction of F. J. Schlink, engineer and physicist, formerly of the United States Bureau of Standards; co-author, *Your Money's Worth*, 100,000,000 Guinea Pigs; and author, *Eat, Drink and Be Wary*.

You can rely upon Consumers' Research *Bulletins* for authoritative, impartial, straightforward, consumer-minded advice and information on products. Ratings are made on the basis of expert judgments of governmental experts and other technical consultants, many thousands of scientific tests made in college and university laboratories, and in CR's own laboratory at Washington, New Jersey.

The *Annual Cumulative Bulletin* is conveniently divided into 14 sections including food; automobiles, parts, accessories, and supplies; textiles and clothing; household appliances and equipment; radio sets and musical instruments; and cameras and film. It is carefully indexed so that a subscriber can readily look up the particular type of commodity which he is contemplating purchasing.

Three dollars a year will bring you this *Annual Cumulative Bulletin* and 9 other *Bulletins* (issued monthly except during July and August). The monthly *Bulletins* contain the latest reports of tests and discussions of commodities and supplement and bring up to date the *Annual Cumulative Bulletin*. You cannot buy the *Annual Cumulative Bulletin* separately. It is available only to subscribers.

Just fill out the blank below and return to us with a remittance of \$3 (Canada, \$3; foreign, \$3.50) and the *Annual Cumulative Bulletin* will be sent you at once.

SOME OF THE BRANDS OR MAKES RATED INCLUDE:

MINIATURE CAMERAS

Anso Memo
Argus
Bantam
Norton
Univex

GASOLINE

Acto
American
Blue Sunoco
Charm
Cities Service
Flash
Flight
Indian
Sinclair Green
White Magic

TYPEWRITERS

L. C. Smith
Remington
Royal
Smith-Corona
Underwood

SAFETY RAZOR BLADES

Barbasol
Gillette Blue
Dublekeen
Durham Duplex
Gem Micromatic
Marlin
Probak
Segal

TOILET SOAPS

Palmolive
Camay
Cashmere Bouquet
and shaving soaps and creams

FOUNTAIN PENS

Shaeffer
Waterman's Ideal
Wahl Eversharp
Parker
Esterbrook

CANNED VEGETABLES

Co-op
Country Club
Del Monte
Heinz
Libby's
Monarch
Phillips
Red and White
Richelieu

CONSUMERS' RESEARCH, INC.
WASHINGTON, N. J.

I am enclosing \$3.00 (foreign \$3.50) for one year's subscription to the Consumers' Research Bulletin (which includes Annual Cumulative Bulletin number and monthly Bulletin numbers—except during July and August). It is understood that my handling of any CR material which is marked "The analyses of commodities, products, or merchandise appearing in this issue are for the sole information of subscribers" will be in accordance with that direction.

Signature.....

Longhand

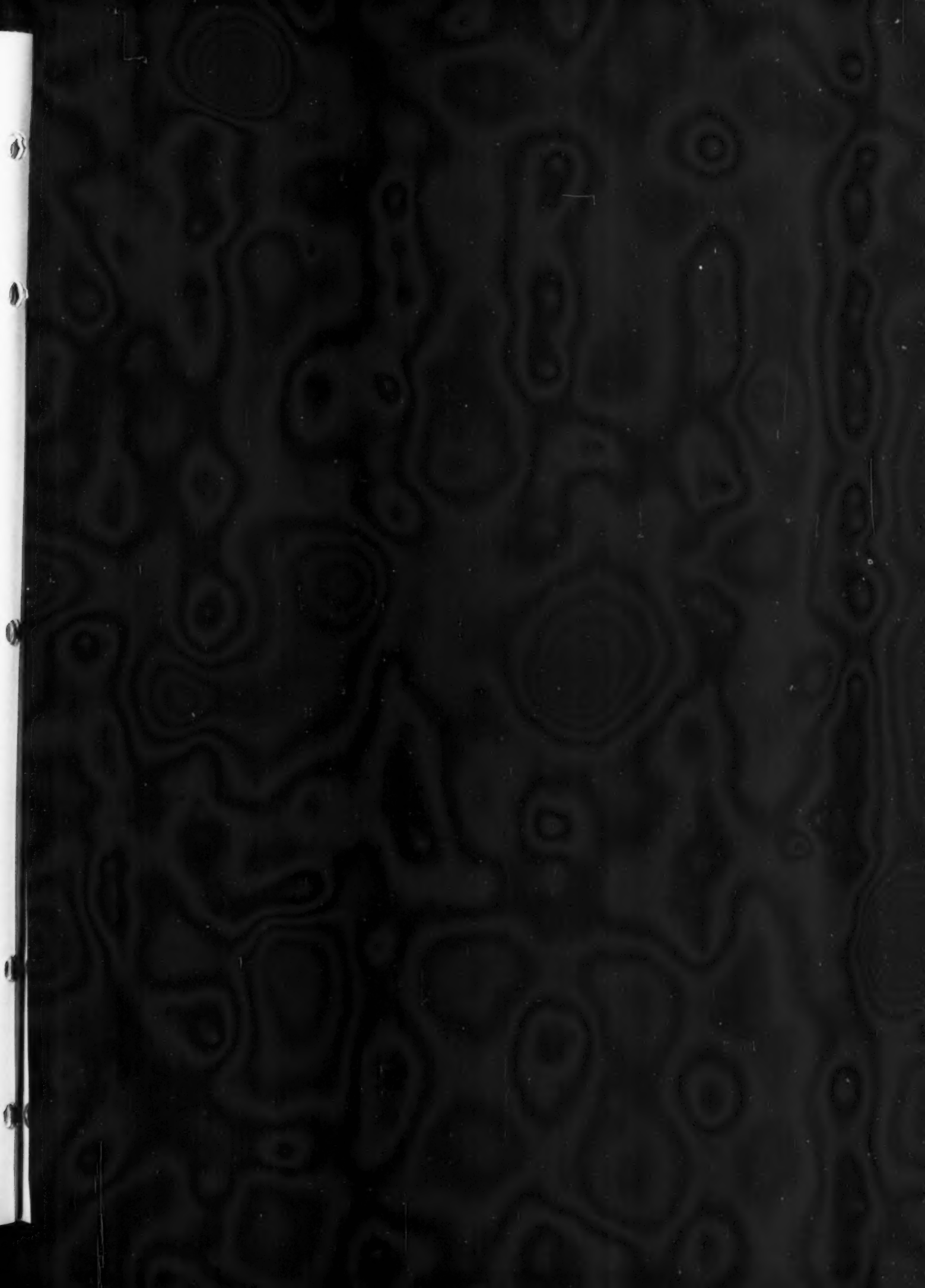
Permanent Address.....

City

State

Profession or Business.....

OCT.





counterpart of the sound, and delivers it to the loud speaker, which transforms it into sound. The power supply is that equipment which takes power from the household lines and delivers power to the receiver at the several alternating- and direct-current voltages required for the various circuit elements.

The two principal types of high-frequency amplifier, the tuned-radio-frequency and the super-heterodyne, have already been briefly discussed.

The detector circuits used in current models, although not yet all that might be desired, are far superior to most of those used in the past.

Audio amplifiers, except for the "output stage," the stage feeding the loud speaker, are not unsatisfactory. It is the good fortune of the public that the resistance-capacity coupled amplifier is the cheapest of single-sided amplifiers (as distinguished from push-pull units) for it is the most faithful, and radio set manufacturers have a distinct, almost invariable, tendency to choose the way which is cheapest and most convenient in manufacture when several ways of solving an electrical circuit problem are available. Good transformers are relatively heavy and expensive, and hence, many trick resistance-coupling circuits have been devised for feeding two tubes which in turn feed the loud speaker. Two tubes in this position, usually in push-pull arrangement, are almost necessary if good reproduction is to be had; but first-class transformers are superior to any of the resistance circuits which have come to my notice—especially when triodes, the most reliable

of tubes free from troublesome and tricky characteristics, are used. The "beam" power tubes have possibilities in that with their use it may be possible to obtain satisfactory performance using power supply systems of less rugged, heavy, and expensive construction than is necessary for use with triodes. It must be emphasized here that distortion in any output stage which uses a *single* beam tube is very high, and such a set is never to be regarded as satisfactory.

The manufacturers still feel that the public can be much impressed by a loud speaker of large physical dimensions. No doubt they are correct. However, they do not mention that the larger the cone the greater the discrimination against the higher frequencies, and the higher frequencies are absolutely necessary to produce musical

sounds that have the correct timbre, or background, that are characteristic of the artist and instrument from which they come and are not just approximations to musical tone and quality. A twelve-inch speaker of good design can reproduce the frequency range required more satisfactorily than a larger one, and it is large enough to move a sufficient volume of air to give good, "solid" reproduction of the low notes.

In general, the power supply is the source of a great deal of distortion. The components used are not capable of doing their job well, solely because the designs are skimmed very seriously in the interest of lightness, and economy. The low notes will never be heard properly, with depth and solidity, until better power supply systems are used. To *simulate* good reproduction of low notes, it is usual to arrange the audio amplifier so that relatively large response is obtained in the medium low range. This excessive response in a limited range, by the way, is the reason speech-

music controls (one form of the tone control) are found necessary, because emphasis on low tones in speech make the voice very unpleasant and "tubby" in quality, so that one quickly tires of it.

The highest fidelity available today cannot be sold in a cabinet, of course, because of the acoustic limitations inherent in cabinets of any customary size and shape. For truly high fidelity the speaker must be properly installed and compensation even made in the audio amplifier for the acoustic characteristics of the room in which it is to be used. Be it noted

here that the tone controls on current receivers are not such as to provide facilities for such compensation.

This does not mean that the home receiver cannot give reproduction much more faithful than can the current commercial models. It very decidedly can, and any one of the older well-constructed machines can be altered at moderate cost to provide much more satisfactory reproduction than can be bought in a new model, however bedight with gadgets and systems of colored lights. The older sets are widely available at very low prices; the results to be expected depend largely upon the technical ability and musical judgment of the man engaged to improve the receiver, and upon the amount spent on the alterations.

GARETH SMITH

CR is now working actively toward a solution of the problem of building up a first-class reproducing device using an old tuned-radio-frequency receiver that can be bought readily at \$5 to \$15, or thereabouts, as a base of operations. It expects to issue specifications that will enable any radio handyman, or competent serviceman, to build for the broadcast listener for perhaps \$40 to \$50 more, accessories that will give the listener a combination approximating in naturalness and reality of sound reproduction, something reasonably near what the present-day radio science and art is capable of providing for consumers generally. Such a set if put into mass production and turned out with reasonable overhead and sales costs could easily be marketed at a price somewhere in the region of \$50, and be superior in performance, as respects quality of sound produced, to sets now running to \$300 and above.

ENCYCLOPEDIAS AND REFERENCE BOOKS

ENCYCLOPEDIAS

THERE IS no longer in America an authoritative comprehensive encyclopedia, of recent edition which ranks with the ninth or even the eleventh edition of the *Britannica*. The fourteenth edition of the *Britannica*, completed in 1929, has in the opinion of qualified critics passed from the class of encyclopedias for scholars. It is interesting and comprehensive, but the *Encyclopedia Americana* now outranks it as a reference authority for scholars.

There are ways by which the inexperienced book buyer can test the value of an encyclopedia. He should not be convinced of its up-to-date-ness by being shown the articles on aviation, Admiral Byrd, and the present Cabinet. Such important and well-known topics are always newly revised as selling points. Instead, he should look up an article on his own home town, or on some other familiar and perhaps obscure subject, photography, bacteriology, or watches and clocks, which he really knows much about himself. He should ascertain that important articles are signed, and that there is authority and responsibility behind the work. Copyright dates should be noticed; the preface should be read and checked for its own claims.

Careless printing may be recognized by blurred illustrations and broken type faces. It is essential that important information such as population figures, statistics, reports, etc., should be dated.

A. Recommended

Encyclopedia Americana (Americana Corp., N.Y.C.) 30 vols. \$99.50 to \$180. Plate changes are made each year to keep the new printings up to date. These revisions are adequate; good judgment is shown in the selection of new information. Contains many short articles on specific topics instead of long monographs on several subjects.

Encyclopaedia Britannica, 14th Edition (Encyclopaedia Britannica, Inc., N.Y.C.) 24 vols. \$120 to \$350. This edition, completed in 1929, contains many of the features of the older editions. Contains long monographs on general subjects instead of many short articles on smaller topics. Numerous revisions have been made in 1936 and 1937.

B. Intermediate

Cambridge Encyclopedia (Cambridge Society, Montreal, Canada) 13 vols. \$59.50. Good but over-priced. Reprinted from *Everyman's*.

Concise Encyclopedia (Wm. H. Wise & Co., N.Y.C.) 8 vols. \$2.98 per vol. Up to date. Well priced.

This article represents a condensation and bringing up to date of three articles on encyclopedias and reference books which appeared in Consumers' Research Bulletins, March, October, and November, 1935. It was prepared for inclusion in the Annual Cumulative Bulletin, September, 1937, but omitted for lack of space. Those who are interested in keeping up to date on this subject will be interested in subscribing to Subscription Books Bulletin, \$1, issued quarterly by the American Library Association, 520 N. Michigan Avenue, Chicago.

B. Intermediate (contd.)

Doubleday's Encyclopedia (Doubleday, Doran & Co., N.Y.C.) 11 vols. \$49.50 to \$69.90.

Facts, the New Concise Pictorial Encyclopedia (Doubleday, Doran & Co.) 4 vols. \$14.75 to \$19.50.

National Encyclopedia (P. F. Collier & Son Corp., N.Y.C.) 10 vols. \$68. Judged poor value at price

Nelson's Perpetual Loose-Leaf Encyclopedia (Thomas Nelson & Sons, N.Y.C.) 13 vols. \$99.50. Scholarly and accurate, but articles are too short. Loose-leaf

feature, judged undesirable for all but a very few users.

Winston's Cumulative Loose-Leaf Encyclopedia and Dictionary (John C. Winston Co., Phila.) 12 vols. \$60. This encyclopedia has certain good features, but loose-leaf feature a drawback.

World Wide Illustrated Encyclopedia (Blue Ribbon Books, Inc., N.Y.C.) 2 vols. \$5.98. Abridged from *Nelson's Perpetual Loose-Leaf Encyclopedia*. Good value, price considered.

C. Not Recommended

Many of the following encyclopedias have appeared from time to time under different names.

American Educator Encyclopedia, *Library of Knowledge*, *Modern American Encyclopedia*, *New Standard Encyclopedia*, *New Universal Encyclopedia*, *Progressive Reference Library*, *Source Book* (Home & School Education Society), *Source Book* (Perpetual Encyclopedia Corp., Chicago), *Times Encyclopedia and Gazetteer*, *Twentieth Century Encyclopedia*.

ONE VOLUME ENCYCLOPEDIAS

While there are many uses for good desk handbooks it should be noted that they do not contain enough material for students in school.

A. Recommended

Columbia Encyclopedia (P. F. Collier & Son, Corp., N.Y.C.) 1 vol. \$17.50. Contains 52,000 entries.

Lincoln Library of Essential Information (Frontier Press, Buffalo) 1 vol. \$15.50 to \$24.50. Excellent small handbook revised each year to keep it up to date.

The World Almanac (World-Telegram, N.Y.C.) Annual vol. 50c to \$1. With the addition of this inexpensive almanac to supply up-to-date information, a well-edited large encyclopedia can serve the average family for many years.

B. Intermediate

Modern Encyclopedia (Wm. H. Wise & Co., N.Y.C.) 1 vol. \$3. A handy desk reference book.

C. Not Recommended

Circle of Knowledge (American Educational Assn., N.Y.C.) 1 vol.

New Century Book of Facts (Continental Publishing Co., Wheeling, W. Va.) 1 vol. Material poorly arranged and often too scanty to be fully useful.

Volume Library (Educators' Assn., N.Y.C.) 1 vol.

CHILDREN'S ENCYCLOPEDIAS

Present methods of teaching used in the schools make it almost necessary for children to have access to reference books in addition to their textbooks. Students can do much quicker superficial reference work when using the type of encyclopedia in which the information is arranged alphabetically under very specific topics rather than under large general heads. If the references are carefully worked out and sufficient in number, an index is unnecessary.

The other system is to present information alphabetically as in an encyclopedia for adults, but under large general heads, each with its proper subheads. Teachers often prefer this method when they wish children to learn about many aspects of some assigned topic and to understand the broader relationships of knowledge. Such an encyclopedia must have an index so that the students may find detailed information under the larger subject.

A. Recommended

Compton's Pictured Encyclopedia (F. E. Compton & Co., Chicago) 15 vols. \$62.50 to \$74.50. Well adapted for grade school children.

World Book Encyclopedia (The Quarrie Corp., Chicago) 19 vols. \$66 to \$85. Excellent for junior and senior high school and can be used satisfactorily for grade school work.

B. Intermediate

Britannica Junior (Encyclopaedia Britannica, Inc., N.Y.C.) 12 vols. \$59.50 to \$69.50. Printed from the plates of Weedon's *Modern Encyclopedia*, a reference work published for children in 1931-32. Revised in 1937. Lamentably "written down."

New Champlin Cyclopedia for Young Folks (P. F. Collier & Son Corp., N.Y.C.) 6 vols. \$39.50. (Also sold by Henry Holt & Son Co., N.Y.C. \$28.) Excellent material but not encyclopedic in makeup.

Richards Cyclopedia (J. A. Richards, Inc., N.Y.C.) 24 vols. in 12. \$39.50. Up to date. Useful subject matter. The arrangement is "split-topical" and awkward. Most of the information is in story form.

C. Not Recommended

The Book of Knowledge (The Grolier Society, N.Y.C.) 20 vols. This (4th edition revised), though sold as an encyclopedia, is not encyclopedic in arrangement or form.

Pictured Knowledge (Marshall Hughes Co., Kansas City, Mo.) 10 vols. Outdated.

ENCYCLOPEDIAS OF HISTORY

Further aid can be secured from *A Guide to Historical Literature* (The American Historical Assn.

and the American Library Assn. cooperating in its preparation; Macmillan Co., 1931) Edited by G. M. Dutcher and others.

A. Recommended

Chronicles of America (Yale University Press, New Haven, Conn.) 50 vols. \$75 to \$250, \$1.50 per vol.

Pageant of America (Yale University Press) 15 vols. \$75 to \$187.50, \$5.50 per vol. A collection of rare and unusual pictures, maps, and incidents.

History of the United States, by James Truslow Adams (Charles Scribner's Sons, N.Y.C.) 4 vols. \$27. The price includes a year's subscription to *Scribner's* magazine and other inducements, but *March of Democracy*, which is not much different, and other books by the same author sold through bookstores, are a better buy.

Mythology of All Races (Marshall Jones Co., Boston) 13 vols. \$10 per vol. A most scholarly compilation, published under the auspices of the Archaeological Institute of America.

New Larned History for Ready Reference, Reading and Research (A. Nichols Publishing Co., Springfield, Mass.) 12 vols. \$105. An encyclopedia of universal history arranged alphabetically.

Universal History of the World (Wilston Bureau, N.Y.C.) 8 vols. \$42.50 to \$64. A new work made up of a series of articles by experts, but simple and easy for the layman to read.

Among histories sold over bookstore counters may be mentioned:

The American Nation (Harper & Bros., N.Y.C.) 28 vols. \$2.25 per vol. A history from original sources edited by Albert Bushnell Hart.

A History of American Life (Macmillan Co., N.Y.C.) 12 vols. (not all published). \$4 per vol. Edited by A. M. Schlesinger and Dixon Ryan Fox. Emphasizes social and intellectual history.

C. Not Recommended

America, Great Events by Famous Historians, Historians' History of the World, History of Nations, Progress of the Nations, Source Records of the World War, and Standard History of the World—all are voluminous compilations of history, varying in quality but not to be recommended.

BIOGRAPHICAL ENCYCLOPEDIAS

A. Recommended

American Men of Science (Science Press, N.Y.C.) 1 vol. \$12. Form, arrangement, and selection of material exemplify the best techniques available for such work.

Dictionary of American Biography (Charles Scribner's Sons, N.Y.C.) 20 vols. \$250. Sponsored by the American Council of Learned Societies.

Leaders in Education (Science Press) 1 vol. \$10.

Who's Who in America (Marquis, Chicago) Biennial vol. \$8.75 per vol.

B. Intermediate

Builders of America (Funk & Wagnalls Co., N.Y.C.) 24 vols. \$12 to \$18.

Catholic Builders of the Nation (Continental Press, Inc., Boston) 5 vols. \$17.50.

National Cyclopedia of American Biography (James T. White & Co., N.Y.C.) 23 vols. \$15 per vol. Can be recommended only for large collections.

C. Not Recommended

American Biography, a New Cyclopaedia; American Women; America's Young Men; Biographical Cyclopaedia of American Women; Century Biographical Encyclopedia. Nebraskana (Baldwin Co., Hebron, Nebr.) 1 vol. \$15 to \$27.50. One of many local biographies compiled in one region and another. Indiscriminate in the choice of subjects to be included.

ENCYCLOPEDIAS OF HEALTH OR "DOCTOR BOOKS"

A. Recommended

Modern Home Physician (Wm. H. Wise & Co., N.Y.C.) 1 vol. \$2.50 to \$3.50. Published in 1934; very practical and simply written; particularly useful in describing home medical and nursing care and in defining medical terms in popular use. Sensible in its analysis of symptoms and treatment.

Black's Medical Adviser (A. & C. Black, Ltd., 4 Soho Square, London, England) 1 vol. 8s. Od. (about \$2) postpaid. Practically the same as *Oxford Medical Adviser for the Home*, now out of print. Gives clear definitions of names of diseases and drugs and of medical terms; little on treatment.

C. Not Recommended

Encyclopedia of Health and Physical Culture (Macfadden Book Co., N.Y.C.) 8 vols. \$49.50; *Health Knowledge* (Medical Book Distributors, Inc., N.Y.C.) 2 vols. \$36.

COMPILATIONS OF KNOWLEDGE AND LITERATURE

A. Recommended

American Literature, a Period Anthology (Macmillan Co., N.Y.C.) 5 vols. \$6.50. This excellent anthology can be purchased in a bookstore for $\frac{1}{10}$ the price of a similar anthology sold by subscription. The Oxford University Press has also printed good anthologies at prices ranging from \$5 to \$10.

B. Intermediate

Columbia University Course in Literature (Columbia University Press, N.Y.C.) 18 vols., \$78 to \$396. Excellent selections, being, in a large measure, the same as those formerly published in *Warner Library of the World's Best Literature*. High price not justified.

C. Not Recommended

Author's Digest; Library of Entertainment, an Anthology of the World's Best Literature; The World's Greatest Books.

RELIGIOUS ENCYCLOPEDIAS

The foremost religious encyclopedia is *Hasting's Encyclopedia of Religion and Ethics*.

Of the compilations of Jewish history and philosophy, the *Jewish Encyclopedia* remains the most outstanding and important. Likewise, the *Catholic Encyclopedia* has not been surpassed, although *Universal Knowledge*, published by the Universal Knowledge Foundation, N.Y.C., is a good, popular, and up-to-date general encyclopedia presenting the Catholic point of view.

DICTIONARIES

A. Recommended

Webster's New International Dictionary of the English Language (G. & C. Merriam Co., Springfield, Mass.) \$20 to \$47.50, according to binding. The reader, con-

fused by the conflicting claims of 45 different English dictionaries, had best narrow his choice to the various editions, differing in size and comprehensiveness, of the two ranking American dictionary publishers: Funk & Wagnalls Co., N.Y.C., and G. & C. Merriam Co.

C. Not Recommended

Webster's Universal Dictionary.

COMPILATIONS OF LITERATURE FOR CHILDREN

We question the value of publishing extracts from children's books. Experience does not warrant the conclusion that such extracts lead the child to the reading of the complete book from which the extract was taken. On the contrary, a child who had read an adaptation will think he has read a complete classic.

A few of these sets are worthy of recognition for use in some rural and isolated homes where there is no access to bookstores and libraries, and no guidance to book selection.

A. Recommended

Children's Hour (Houghton, Mifflin Co., Boston) 10 vols. \$16.

My Bookhouse (The Bookhouse for Children, Chicago) 12 vols. \$33 to \$49.50.

My Travelship (The Bookhouse for Children) 3 vols. \$9.75 to \$18.25.

B. Intermediate

Childcraft (The Quarrie Corp., Chicago) 6 vols. \$38. *Foundation Library* (Foundation Desk Co., Chicago) Parent division \$19.75; teacher division \$20.75. Includes suggestions for keeping children busy.

Journeys Through Bookland (Bellows-Reeve Co., Chicago) 11 vols. \$48.75 to \$56.75. Volumes are graded from kindergarten to high school.

Kindergarten Children's Hour (Houghton, Mifflin Co.) 5 vols. \$8. Slightly old fashioned.

Lands and People (The Grolier Society, N.Y.C.) 7 vols. \$49.50. The geographical supplement is excellent, but a subscription to the *National Geographic* will buy the same kind of material for \$3.50 per year (\$3 to members of the National Geographic Society).

New Wonder World (George L. Shuman & Co., Chicago) 11 vols. \$66.50 to \$76.50.

C. Not Recommended

Book Trails, Children's Library, Home University Book shelf, Junior Classics, Junior Home, Picture Knowledge, Young Folks' Library.

COMMERCIAL SORORITIES

A new practice in the selling of certain encyclopedias of literature has developed in recent years. Books are sold along with a membership in a club or sorority.

C. Not Recommended

Beta Sigma Pi Membership, using as a basis for its study course, the *Universal Anthology*; *Epsilon Sigma Alpha* Membership, \$93.50, using as a basis for its study course, *The Writings of Mankind*; *Kappa Gamma* Membership, \$39.50 using as a basis for its study course, *The University Extension Forum*; *Pi Omicron* Membership, \$96 using as a basis for its study course, the *University Library*.

PRIVATE WATER SUPPLY SYSTEMS

WHEN THE household water supply is a well or spring, it will be wise to obtain a bacteriological and a chemical analysis of the water to determine its purity for drinking, and its effect upon piping. Bacterial contamination is more likely with a spring than with a well, unless the spring is in a remote and uninhabited terrain far distant from other habitations. Springs are more likely to be contaminated in regions having underlying limestone strata because surface water from the surrounding regions near stables, privies, or other places where contaminating material is present, is likely to get into water in a limestone region, through holes or fissures which may carry heavily contaminated surface water down immediately to ground water levels. "Springs in limestone or dolomite are with good reason looked upon with suspicion. . . . The purity of the water [should be] verified by repeated tests," says one authority.

Chemical analysis to indicate the probable effect of the water supply upon the piping is especially necessary where the plumbing installation is to be an expensive one. Such analysis may determine, for example, that galvanized iron pipe will serve better than copper or brass pipe (as indeed often turns out to be the case). Spring water is likely to be more corrosive to piping and tanks than city water.

Much can be learned on the safety of wells and springs, as a rule, by bulletins from your state university or state water supply authorities, often in the Department of Health. Such printed and mimeographed material as is available should be asked for because problems of water supply contamination differ greatly with the nature of the geological strata—contamination at great distances from a stable, a cesspool, a filling station that may dispense the deadly leaded gasoline, being particularly likely in limestone regions, as has already been noted. If water is acid, piping, strainers, cylinders, pump rods, etc., should be of non-corrosive material. Piping, tanks, etc., should, however, be either of a ferrous material (iron and steel) throughout or of non-ferrous (copper and brass); the two types should not be mixed. A cement wash, consisting of Portland cement and water thinned to brushing consistency, makes an excellent protective covering for the inside surface of tanks where water is slightly acid. At best, it is extremely difficult to avoid metallic contaminations in drinking water, whether in a public system or in your own home supply, and in the interest of health, every possible precaution should be taken against this. When using a system pumping against air pressure, do not, unless the water is hard, locate iron or even galvanized-iron tanks at points remote from the pump.

Water-storage pressure tanks should be provided with a manhole for cleaning. Pumps and wells should be so located as to be readily accessible from above. The well should be so constructed

that it cannot be entered and inhabited by snakes, rats, woodchucks, frogs, etc., and that it will remain free from odor- and taste-producing vegetable growths. Fish should never be introduced into a well for scavenging. Wells in any area which may have been flooded and so rendered unsafe should be disinfected by the use of chlorinated lime.

Rain water collected from roofs into cisterns provides excellent soft water for washing purposes and in many localities is used as drinking water. To avoid the serious hazard of lead poisoning, assure yourself, absolutely, that no lead or lead alloy or solder is present in any part of the construction of roofs, flashings, gutters, etc.

Water-supply requirements are variable, but for average purposes, exclusive of lawn sprinkling, should be based on at least 50 gallons per day per person in a home. Complete pumping outfits consist of pump, tank, and regulating device for shallow wells or springs and can be purchased for upwards of \$40 for automatic electric operation, and at slightly higher cost with gasoline-engine power. Deep-well systems will come to about twice as much. The gasoline unit has certain advantages over electric units in country installations where power may at times be off for hours or days, unless some adequate alternative source of safe drinking water is available for use in such an eventuality.

Information will be gladly received and placed on file from those who have had experience with household pumping systems and some technical knowledge or its equivalent in experience.

Shallow Well Pumps

B. Intermediate

Goulds CID, No. C-2518 (Goulds Pumps, Inc., Seneca Falls, N.Y.) \$67. Capacity 250 gal per hr. May warrant an A rating, when further test results are available.

Westco "Go-Getter," Type GG (Micro-Westco Co., Inc., Bettendorf, Iowa) Turbine type. Available information indicates this to be a satisfactory type of pump. May warrant an A rating when test results are available. p 36

Tests of the following mail-order house pumps are not yet complete, but it is evident from data now at hand they will not warrant higher than a B rating. Cost of operation ranges from 1 to 2 kilowatt-hours per 1000 gallons, depending upon conditions, such as depth of water surface below pump, etc.

Ever-Ready, Cat. No. 42-2283 (Distrib. Sears, Roebuck & Co.) \$41.50 plus freight. Capacity 250 gal per hr. Somewhat noisy in operation. cr 37

Montgomery Ward & Co., Cat. No. 3398. \$41.50 plus freight. Capacity 250 gal per hr. Air volume control device on tank failed after relatively short period of use. Outfit was somewhat noisy in operation. cr 37

ELECTRIC IRONING MACHINES

THERE IS MUCH room for debate whether the purchase of an electric ironing machine is desirable for the average household. The considerable expenditure required for the purchase of such an appliance is justified only if the saving of energy in ironing and a small saving of time (10 to 20 percent) are considered to be worth the extra expense. Whether there will be a saving of time depends largely upon the character of the average laundry work in the household. If there is a large amount of flatwork to be ironed and if the operator of the machine is one who will develop considerable skill with experience, a good deal of time can be saved. When there are few sheets, pillow cases, table cloths, bedspreads, dresser scarves, towels, and the like, the electric ironing machine will have difficulty in justifying itself either economically or on the score of convenience. In CR's opinion, the advantage to be gained will usually not be great enough to warrant the expense in a family of fewer than four or five, assuming that the entire ironing is done at home by the housewife. This advice, largely a repetition of material given in CR's *Bulletins* of previous years, is now given in the light of extensive new tests of ironing machines which CR has just completed, and is perhaps the best general advice that can at present be given to a housewife who is facing the problem of whether or not to purchase an ironing machine and who has to give consideration to the cost of the new appliance.

The discussions concerning ironing machines which one can hear, or read about, are frequently inconsistent. The inconsistencies, however, are often only apparent, and can be explained as in part due to differences in the ironers used, and in part as related to the differences in different homes, of the assortments of pieces ironed. Perhaps the most favorable printed comment on ironers is that given in one of the western state experiment station bulletins, which says: "It was found that the ironing machine completed the ironing of the same size and type of washing in less than one-half the time required by the electric hand iron." On the other side we quote a part of a letter printed in a recent issue of a prominent electrical industry trade journal:

To the Editor:

I am amused by your constant boosting of the domestic ironing machine. You bemoan the fact that sales are in the ratio of 1 to 10 washers, and I wonder if you have ever tried to operate one, or have other than a skilled demonstrator, try to operate one . . .

I am of the firm belief that fully half of those sold are never used after a few unsuccessful attempts. The reason the ironer doesn't sell is because it's not practical. It's a joke to say you can iron shirts or dresses (yes, a highly-practiced demonstrator can) and as for sheets, you have to fold them so much before putting them through that much of the area remains unironed . . .

Maybe the industry can improve the ironer so that these objections are overcome, but until that time they are injuring themselves by foisting on the public a half-baked idea which quickly goes into disuse to the disgust of the buyer.

A well-known home economist wrote to CR: "On handkerchiefs we got an average time of .47 minutes . . . with the hand iron, but .49 minutes [per handkerchief] . . . on the ironer. Conclusion: no significant difference with small items, but on sheets and tablecloths we found a saving of two to four minutes for each on the ironer." In attempting to reconcile the various statements concerning the saving in time which the machine ironer effects over the flatiron, it should be remembered that in recent years electric hand irons have been considerably improved in effectiveness and convenience by decreases in weight, increases in their soleplate area, and increases in power used from approximately 600 watts to 1000 watts. (The latter factor is of course a rough but actual measure of a very substantial increase in speed of ironing of the heavier pieces, and flatwork.) Comparisons of the performance of ironing machines with that of flatirons made on the basis of tests using the old designs of flatirons operating at lower wattages, would, therefore, not be valid as indicating the relative performance of present-day equipment.

Besides a saving in time which the ironing machine will in general accomplish in doing flatwork, there is one other advantage which it may provide, namely, a saving in effort. On labor-saving, as well as on time-saving, there is a wide difference in the reports which one hears or reads. The same experiment station bulletin already referred to states, for instance, that: "The wife on one farm machine-ironed all of a large washing about one week after her return from a hospital where she had undergone a major operation." A manufacturer of ironing machines would hardly hope for or dare to claim more! The saving in effort, however, has been found, in other experiments, to depend upon the type of ironing machine used, so that, before discussing the labor-saving characteristics of ironers further, it will be well to consider the types of ironers available.

There are two types of household ironing machines, the rotary ironer (usually open only at one end and having a roll pressing against a shoe, which usually is above the roller), and the flat presser (consisting of a broad, flat, or nearly flat shoe, which presses down upon a stationary, padded surface.) The first is a heated mangle, the second a small modification adapted for the home, of the common tailor's pressing machine. Each type has its advantages and offsetting disadvantages. The mangle has been shown to save more of the energy of the operator than does the presser (unless, perhaps, the squeezing action of the latter is operated by a motor—and most

pressers are not).

In CR's test the operator was fatigued nearly as much by using the flat hand-operated presser on a typical weekly washing, as by using a high-grade automatic flatiron to do the same work. The mangle type of ironer worked faster than either the flatiron or the presser, although the different machines tested were not equally rapid. But with none of the machines tested by CR would the amount of time saved per week for the housewife be great; perhaps, say, an hour or two a week at the most in a family of four or five, and that saving will depend largely upon the number of large, flat pieces which have to be ironed. In CR's tests, one of the presser-type ironers was found actually to be somewhat slower than the modern flatiron. The time saved by the fastest mangle in CR's test was twenty-one minutes, or about one-eighth, or twelve percent, of the time required to do the ironing by means of the flatiron (a little under three hours). To sum this all up briefly, it may be said that in comparison with an up-to-date efficient electric flatiron the roll-type ironers save work and fatigue but only a little time in doing a typical small-family laundry, while the flat-press ironers save very little work and do not save time at all.

Offsetting to some extent the comparative disadvantages which have been noted, of the presser, is the somewhat better quality of work which it does. In the tests it produced fewer wrinkles, and straighter edges, due to the fact that with the mangles the operator could not always guide the material into the roll straight and even. Some "touching up" with a hand iron will likely be required with either type of machine, especially on articles of clothing. The presser is obviously somewhat safer to use than the mangle because there is no power-driven roll which, by pulling on the piece being ironed might accidentally catch the operator's clothing or hand, and pull her hand against the hot shoe. With the four mangles which CR tested, the danger of the operator's hand being accidentally dragged against the shoe and seriously burned, or crushed, would seem to be rather remote, for the reason that the operator's hand does not need to be close to the roll while it is operating. Clothes are not fed to the machine when the roll is turning in the way that clothes are fed to the power-driven wringer of a washing machine. The knee control which mangles usually have, makes it possible quickly to stop the machine and to lift the shoe. In case of emergency, or if the electric power is interrupted, the shoe may be raised by a separate hand-operated pressure release—an important safety feature which no machine should lack. None in CR's test did.

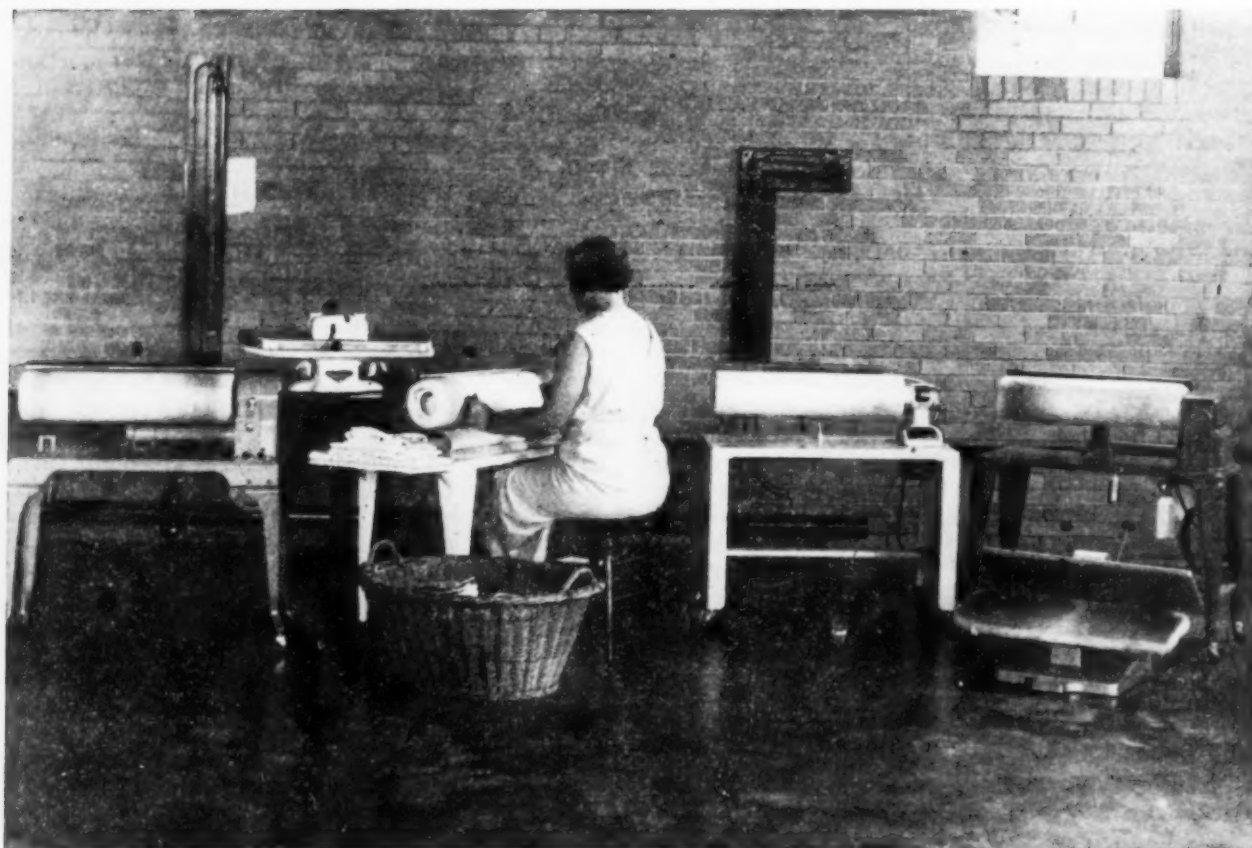
There is not yet available in CR's files sufficient data upon the personal hazard in the use of ironing machines to warrant a judgment in this respect, possibly because the number of power ironers in use is fairly small. It is a fact, however, that there have been few reports of accidents with them (as compared, for example, with power wringers of washing machines). In presenting these judgments of power ironers, it is to be understood that there is as yet no basis for certain

judgment on the factor of safety. It would appear that an operator whose attention might be momentarily diverted, or a child playing at the machine during a mother's brief absence, could, granted a certain combination of circumstances, suffer a severe injury and burn from any one of the mangle-type ironers tested.

Shoes having their temperatures automatically controlled (there should be a separate thermostat at each end) are very desirable, but only the *Meadows* presser type machine of those tested had this feature. The shoe of this machine maintained a uniform temperature, which could be adjusted for light, heavy, dry, or damp pieces. The temperature of the other machines had to be controlled by the operator's turning on and off a switch from time to time. If the temperature is not automatically controlled, there should at least be a plain, easily observed temperature indicator to guide the operator, yet only the *General Electric* presser type model of the non-automatically controlled machines had such an indicator.

The mangles had knee controls which, in general, were convenient and easy to operate. The control of the *Thor*, could either be used as a knee control or be removed from the machine and used as a foot control. There should be adequate clearance between the roll and the shoe of the mangle—approximately one-half inch or slightly more. The clearance for the *Thor* and *Kenmore* was, however, more than twice this and while this made it easier to adjust the pieces about to be ironed without burning the fingers of the operator, the greater clearance presented more hazard of the fingers being caught between the roll and the shoe. There should be clearance of approximately two inches between the end of shoe and gear housing and between the end of roll and gear housing so that a wide, heavy cloth which extends beyond the end of the roll will not be jammed and wrinkled in ironing. The *Thor* had the best clearance; Montgomery Ward's, the poorest. Foot-operated brakes for the casters (only on the *Easy* of the roll-type machines tested) to keep the machine from rolling on the floor while it is in use are more convenient than hand-operated brakes.

All of the machines which CR tested were found to pass the customary standard tests for safety of electrical insulation. CR, however, cautions against using any ironer on a concrete laundry or cellar floor, or where the operator would come in contact with a water faucet, a radiator, or pipes or plumbing fittings of any kind while the ironer is connected to the power line. (This is an excellent rule which the consumer should remember when using any sort of electrical apparatus. A vacuum cleaner, for instance, which presents a shock hazard becomes extremely dangerous when it is touched simultaneously with a radiator, a gas pipe, or a water faucet.) The advice, "Use only in dry location" which was on the nameplate of the *Kenmore* machine should be heeded by the operator of any ironer of any make. If absolutely necessary to use in a basement or other damp location, the machine should be securely grounded in a workmanlike manner by an electri-



cian. A dry wooden floor is a good electrical insulator, and therefore, if the machine must be used in the basement it is a wise precaution against accidental electrical shock to install a wooden floor, large enough to accommodate the machine and the operator. The floor should be laid on cross pieces to prevent its absorbing moisture from below, and the nails should be driven into the boards in such a fashion that no part of the nail projects beyond or comes up to the level of the boards, so that there will be no danger of making contact through the shoe of the operator or through a metal stool or chair with a nail or nail head. An engineering-minded person might go further and actually introduce an insulating layer of some kind in the structure of the platform, as by setting it in glass cups at its four corners. (Such a platform should be in addition to the permanent grounding of the frame of the machine, already referred to).

In the test made by CR the operating cost for electricity of the six ironing machines averaged one-quarter more than the operating cost of the *Sunbeam Ironmaster* automatic flatiron used for doing the same work—a difference which, expressed in money terms, will be smaller than most people would consider important as a basis of choice between the two methods of ironing.

Prices for the six machines ranged from \$29.95 to \$59.95. As is so often the case with electrical appliances, there was no reliable relationship found between price and quality; as with other goods, one does *not* get what one pays for, contrary

to the universal tenets and solemn assurances of merchants and salesmen everywhere. Furthermore, quality of performance was not in any way related to the magnitude, splendor, or vividness of verbiage in the manufacturer's advertising.

Four of the machines were of the rotary type, open at one end only; the other two machines were of the presser type. All of the machines were tested for rapidity and uniformity of heating and for electrical characteristics, and were given practical performance tests and limited endurance tests. All ratings are *cr 37*.

B. Intermediate

Montgomery Ward & Co., Cat. No. 285—166. \$29.95 plus freight. *Mangle type*. 110 volts, a-c only. 30-day home trial allowed. Clearance between roll and shoe judged small enough to afford some protection against accidentally getting fingers caught between roll and shoe. Clearance between end of shoe and gear housing and between end of roll and gear housing seems unduly limited. Judged to iron particularly heavy, damp pieces not quite so smoothly as the other roll type machines tested. **1**

Kenmore, Cat. No. 22 EM 3202 (Distrib. Sears, Roebuck & Co.) \$37.50 plus freight. *Mangle type*. 120 volts, a-c only. The only machine tested which had a signal light—for showing when heater is turned on—a very important feature. Shoe could not be tipped back to permit steaming of fabrics. No hooks were provided upon which to wind up the cord. This machine, which was purchased for test in April of this

B. Intermediate (contd.)

year is not listed in Sears, Roebuck & Co.'s winter catalog, but may be available in many of their retail stores. Machine most nearly corresponding to one tested is No. 22 FM 3220 in new catalog. **1**

Easy, Model 30 (Easy Washing Machine Corp., Syracuse, N. Y.) \$59.95. *Mangle type* 115 volts, a-c only. Clearance between roll and shoe judged small enough to afford some protection against accidentally getting fingers caught between the roll and shoe. Only machine tested that was equipped with a cover cloth for protection from dust. All should have been so equipped, of course. Had convenient foot-operated brakes on casters. **2**

Meadows, Model D-1 (Meadows Mfg. Co., Bloomington, Ill.) \$59.50. *Presser type*. 110-120 volts, a-c=d-c (only the a-c was used in the test). Temperature was

B. Intermediate (contd.)

thermostatically controlled, a very desirable feature that should have been present in all models; but lacked signal light, an equally essential feature. **2**

Thor, Model 61-S (Hurley Machine Co., Chicago) \$49.95.

Mangle type. 110-120 volts, a-c only. Control mechanism somewhat difficult to operate as a knee control; easy as a foot control. Had best clearance between end of shoe and gear housing and end of roll and gear housing of the machines tested (convenient). No hooks were provided upon which to wind up the cord. **2**

C. Not Recommended

General Electric, Model AF-5 (General Electric Co., Bridgeport, Conn.) \$59.50. *Presser type*. 110 volts, a-c only. Equipped with temperature indicator, but lacked thermostatic control of temperature provided in *Meadows*. **2**

ELECTRICAL HEATING APPLIANCE CORD SETS and LAMP CORDS

PROBABLY the weakest and most troublesome parts of the household electrical circuit are the flexible conductors, appliance cords, so called. Especially troublesome are the cords of heating appliances, for appliances which produce a considerable amount of heat, such as flatirons, toasters, waffle irons, and room heaters, are characterized by a relatively large energy consumption as compared with other appliances, such as electric fans, kitchen beaters and mixers, electric razors, washing machines, or radios—the former group generally taking from five to ten times as much as the latter. The heating appliance cord and its connecting plugs must be capable of safely carrying, and of remaining in safe condition to carry, the heavy current flow. The conditions of use are very often much more severe than those to which other types of appliance cords are subjected, since heating appliances are usually portable or require moving around in use, with attendant greater wear, kinking, and strain on the cords. In addition, there is the possibility or actuality of contact with hot surfaces.

With some types of commodities (hot-water bottles, for example) the lowest-priced article is sometimes the one which gives the most service for each cent of its purchase price. This is unlikely to be the case with electrical heating appliance cords. Skimpily construction, poor design, low-grade materials, all making for a short and unsafe life, are very likely to characterize the cord sets sold by 10-or 25-cent to \$1 stores—the so-called variety-chain stores, and other “bargain” or cut-rate stores. One typical sample of such bargain cords was included in CR's test. The conductor of a good heater cord will be not smaller than No. 16 (American Wire Gauge). To give good flexibility and durability, it may be composed of as many as 105 strands of fine wire. Its covering will include a wrapping of not less than three and one-half pounds of asbestos per 1000 feet. In the cheap cord tested, the conductor was

No. 20 gauge (which has 60 percent smaller area of conductor than the minimum for a good cord) and had only ten strands of relatively coarse wire. The covering contained considerably less than a pound of asbestos per 1000 feet. In a twisting test on a specially designed machine, this cord lasted only 410 twists until failure, whereas the best cord tested withstood over 25,000. Such cheap cords, however low their first cost, are bound to be an expensive purchase, and their use is fraught with the dangers of fire or personal injury which may at any time accompany failure of electrical equipment in service, under load.

There is of course little excuse for a cord set failing, with the fireworks which very often accompany a short circuit. A good cord should not be permitted, through long use, to reach that state of disrepair or final disintegration at which failure is imminent, and cheap cords which reach such a stage very quickly should by all means be studiously avoided. Cords and plugs should be inspected occasionally and kept in good order, instead of waiting until a fuse is blown, and perhaps someone burned, or a fire started, or an appliance ceases to operate at a time when it is most needed.

Each of the three components of a cord set, the cord, the attachment plug (the two-prong plug which goes into the wall receptacle), and the appliance plug (which receives the two prongs on the appliance), was subjected to a series of mechanical tests designed to permit a comparison of the quality and durability of the different makes. Comparison was also made for length of cord, wire sizes, amount of asbestos, and presence of free sulphur in the rubber jacket (which contributes to early failure by causing the copper conductor to become brittle). Electrical tests included high voltage breakdown (which all cords passed successfully) and electrical resistance of appliance plug contacts. Heat and inflammability tests were also applied to the appliance plugs, and those

which were equipped with a switch were examined by a qualified engineer for adequacy and safety of design. Switches were in general found to be of poor construction, and should be avoided as being a likely added source of trouble; they are not needed on thermostatically controlled flatirons. Avoid cord sets which do not bear the Underwriters' Laboratories label. Where not otherwise noted brand names of the plugs and cords were the same as that of the cord sets. Price ratings are on basis of probable service for each cent of cost to the purchaser, as indicated by performance of the cord alone. All ratings are cr 37.

A. Recommended

- General Cable* (General Cable Corp., Buffalo, N.Y.) 60c. *Cutler-Hammer* appliance plug, *Belden* attachment plug. Length, 8 ft. No. 16 conductor. The only cord set tested of which all the parts rated A. Durability of cord in twisting or mechanical life test, nearly twice that of the next best cord; resistance to abrasion, only fair. 1
- Hatfield Angle Cord Set*, No. 16-10M (Hatfield Wire & Cable Co., Hillside, N.J.) 60c. Length, 7 ft. No. 16 conductor. Resistance to abrasion, best by a considerable margin of all the cords tested. Appliance plug would rate B. *Intermediate*. Cord attached at side of appliance plug, probably convenient. 1

B. Intermediate

- Heatmaster*, Cat. No. 20¹—617 (Distrib. Sears, Roebuck & Co.) 30c plus postage. *Collyer* cord, *Arrow-Hart & Hegeman* appliance plug, *Belden* attachment plug. Length, 7 ft. No. 16 conductor. Durability of cord in twisting test, good; resistance to abrasion, relatively poor. Appliance plug was of a type which breaks easily, but otherwise of good quality. 1
- Monowatt*, No. 500 (The Monowatt Electric Corp., Bridgeport, Conn.; distrib. S. S. Kresge Co.) 25c. *General Electric* cord. Length, 6 ft, which is too short. No. 18 conductor, which is too small. Durability of cord in twisting test, fair; resistance to abrasion, very good. Amount of asbestos used in construction, slightly low. Switch type appliance plug, fair. 1
- Belden*, No. 1718 (Belden Manufacturing Co., Chicago) 40c. Length, 6 ft, which is too short. No. 18 conductor, which is too small. Durability of cord in twisting test, fair; resistance to abrasion, very good. Amount of asbestos used in construction, somewhat low. Appliance plug (*Belden*, No. 333), the best of those tested. 2
- Sunbeam*, No. 1 (Chicago Flexible Shaft Co., Chicago) \$1. A. I. W. cord, *Allied Mercantile* attachment plug. Length, 6 ft. No. 16 conductor. Durability of cord good, but rubber contained free sulphur which is indicative of short life, apart from breakdown due to use or handling. Amount of asbestos used in construction slightly low. Appliance plug well designed and constructed. 2
- Westinghouse*, No. M107 (Westinghouse Electric & Manufacturing Co., Mansfield, Ohio) 99c. *General Cable* cord, *Bryant* appliance plug, *Diamond Braiding Mills* attachment plug. Length, 6 ft, which is too short. No. 18 conductor, which is too small. Durability of cord in twisting test, second best of cords tested; resistance to abrasion, above average. 2

C. Not Recommended

- Wards*, Cat. No. 84—9480. (Distrib. Montgomery Ward & Co.) 33c plus postage. *General Electric* cord, very good in performance; appliance plug, very poor. 1
- H & H*, No. 154 (The Arrow-Hart & Hegeman Electric Co., Hartford, Conn.) 65c. *Rockbestos* cord. Length, 6 ft, which is too short. No. 18 conductor, which is too small. Cord performance, fair. Appliance plug with switch well made except for a deficiency in contact-making area of switch. 2
- Snap-it*, No. 221P (Marks Products Co., Brooklyn, N.Y.; distrib. W.T. Grant Co.) 50c. A. I. W. cord. Design of contact springs of switch-type appliance plug grossly defective. 2
- Meteor*, No. 1113 (Meteor Electric Corp., Brooklyn, N.Y.; distrib. F. W. Woolworth Co.) 30c. A. I. W. cord. Length, 6 ft, which is too short. Switch-type appliance plug, weakly constructed. Cord inferior. 2
- Goldblatts* (Distrib. Goldblatt Bros. stores, Chicago) 14c. Length, 5½ ft, which is much too short. No. 20 conductor, far too small to carry safely the current taken by a heating appliance. Very little asbestos used in construction. Construction and quality were those typical of the jerry-built or "special sale" merchandise often sold by "bargain" and "variety-chain" stores. 3

Lamp Cords

In a test of thirteen brands of lamp cords, there were four general types represented (distinguished by arbitrary symbols M, N, O, or P). Two cords were of type M, the twisted variety, of which the separate wires were much larger in diameter than those now commonly used for extensions and drop cords, with green and yellow cotton braided covering over the individual conductors, having the familiar dominant light green tone that used to be standard for lamp cords. Type N, of which four brands were tested, is a familiar type of cord with the conductors not twisted, but running parallel, encased in a single cotton or rayon or silk sheath. Types O and P are the all-rubber or latex-jacketed parallel cord which was introduced several years ago. In type O, termed "integral construction," the cotton-wound conductors are enclosed directly in the rubber jacket, which is scored down the center for easy separation when connections are to be made to a wall plug or appliance. In type P, termed "separate-constructions," the conductors have individual jackets of cotton or paper and rubber inside the single encasing jacket, which is not scored. Four brands of type O, and three of the type P were included in the test.

The test results revealed large differences in the quality of the rubber compounds used for insulation, both as to aging properties and resistance to abrasion. Like all rubber goods, lamp cord deteriorates steadily and surely, and the purchaser should buy from sources likely to have rapid turnover. In some cases the purchaser may be able to ascertain the date of manufacture, which is required by Underwriters' Laboratories to be marked on the label of the spool, or on the tag attached to the

coil. Buy only cords with Underwriters' Laboratories "bracelets," which are metal and paper slips secured around the cord at intervals along its length.

The test included detailed examination and measurement of insulation and conductor, an abrasion test on the outside covering, a test to determine the aging properties of the rubber, tests for resistance to mechanical injury, and measurement of breakdown voltage (which is the voltage at which electricity would jump across from one conductor to the other through the insulation). Cords were nominally equivalent, in aggregate cross-sectional area of the wires of which they were composed, to No. 18 American Wire Gauge wire. All ratings are cr 37.

A. Recommended

TYPE M

Twisted Cord, Cat. No. 20—6793 (Collyer Insulated Wire Co., Pawtucket, R. I.; distrib. Sears, Roebuck & Co.) 1.25c per ft plus postage. Resistance to abrasion and to aging, good.

TYPE N

Lamp Cord, Cat. No. 20—6682 Maroon (Collyer Insulated Wire Co.; distrib. Sears, Roebuck & Co.) 1.25c per ft plus postage. Resistance to abrasion, very good; to aging, good.

A. I. W. Corp. (American Insulated Wire Corp., Providence, R. I.; distrib. F. W. Woolworth Co., spool labeled Meteor Electric Co.) 1.25c per ft. Resistance to abrasion, very good; to aging, good.

TYPE O

General Electric (General Electric Co., Bridgeport, Conn.; distrib. S. S. Kresge Co., spool labeled Monowatt Electric Co.) 1.25c per ft. Resistance to abrasion, very good; to aging, good. Cross-sectional area, somewhat small.

TYPE P

Latex (Simplex Wire & Cable Co., Boston) 3.5c per ft. Resistance to abrasion, fair; to aging, best of the types O and P cords tested. Ivory colored sample became darker during aging test.

B. Intermediate

TYPE O

"Zip Cord," Cat. No. 84—9067, Ivory (U. S. Rubber Products, Inc., N.Y.C.; distrib. Montgomery Ward & Co.) 1.5c per ft plus postage. Resistance to abrasion, fair. Cotton around conductor wound with spaces between turns, which is an undesirable mode of wrapping, resulting in intermittent blackening of the copper by the sulphur in the rubber.

Lamp Cord, Cat. No. 20—6689, Ivory (Collyer Insulated Wire Co.; distrib. Sears, Roebuck & Co.) 1.25c per ft plus postage. Resistance to abrasion and to aging, fair. Cross-sectional area, somewhat small.

TYPE P

Supertex (Simplex Wire & Cable Co.; distrib. General Cable Co.) 4c per ft. Resistance to aging, very good; to abrasion, poor.

C. Not Recommended

TYPE M

Twisted Cotton Cord, Cat. No. 84—9069 (U. S. Rubber Products, Inc.; distrib. Montgomery Ward & Co.) 1.5c per ft plus postage. Resistance to abrasion, poor.

TYPE N

Rayon Lamp Cord, Cat. No. 84—9068, Pearl Gray (U.S. Rubber Products, Inc.; distrib. Montgomery Ward & Co.) 1.5c per ft plus postage. Resistance to abrasion, poor. Rubber undercured.

Lamp Cord (Davis-Jones Wire Co., Pawtucket, R.I.; distrib. W. T. Grant Co.) 1.25c per ft. Resistance to aging of rubber compound, very poor.

TYPE O

Crescord, Ivory (Crescent Insulated Wire & Cable Co., Trenton, N. J.) 2c per ft. Resistance to abrasion, poor.

TYPE P

Belden Manufacturing Co., Chicago. 3c per ft. Resistance to aging and to mechanical injury, very poor.

BINDERS FOR CR MATERIAL NOW AVAILABLE

At the request of many subscribers, CR has purchased a quantity of reasonably priced, attractive, durable, smooth, black fiberboard binders, imprinted:

Consumers' Research Bulletins
Consumers' Research, Washington, N. J.

These will easily hold a full year's issue of CR *Bulletins*. They will be available to CR's subscribers at cost, 25c postpaid, from Consumers' Research. A more expensive and elaborate binder called the *Permo* is available from the American Binder Co., 551 Fifth Ave., N. Y. C., at \$1.75.

CONTRIBUTOR

GARETH SMITH is the pseudonym of a graduate electrical engineer employed by a large electrical manufacturer, who is specially qualified in radio set design from the standpoint of high-quality (faithful, realistic) reproduction of broadcast programs.

SIGNS AND PORTENTS

MANUFACTURERS' cost [in men's clothing], including taxes and labor bills, are up about 20%. Manufacturers' prices are up 10-15%. Retail prices for fall will be up from \$2.50 to \$10 a suit. It takes an economically healthy country to swallow that big a price rise.

Big manufacturers in Chicago and in Rochester, N. Y., selling established, nationally advertised brands, have not cut quality. The same goes for the better houses in Cincinnati, whose clothing industry is partly ready-to-wear, and partly based on business scared up by salesmen who scoot from county seat to county seat in motor cars, measuring the town lawyer, doctor, and banker. The industry knows that most business and professional men will gladly pay higher prices for superior suits if their incomes permit it. But the industry knows, too, that salaries of office workers and many other white collar people, who are bigger consumers of ready-to-wear suits than factory workers, haven't shot upward like factory workers' wages. And it has no doubt that fall price advances will meet with mixed reactions. ("Men's Clothing Prices Up 10-15%," in *Business Week*, July 3, 1937.)

The high cost of living (familiarily known as the H. C. of L.) is rapidly mounting. Whether or not it can be checked depends on a great many factors, of which one of the most important is the state of the consumer's mind and particularly of the consumer's sales resistance. If consumers refuse to allow themselves to be made the goat of our present economic mess (with the New Deal's overtones of legalized and forced price fixing), if they confine their buying almost entirely to actual necessities, then, inevitably, prices will come down, for goods must be sold. That is the kind of an economic system we have—or at least we have considerable parts of such an economic system yet, and will have until some bright Corcorans and Cohens in the New Deal figure out ways to invalidate larger sections of it for the greater glory of the Mad-Hatter Economics that have gone into governmental industrial and agricultural controls, against consumer interests, in the last five years.

A NEW price fixing body—the gasoline station union—has made its debut in Cleveland this week as a price fixing group.

The union, composed of gasoline station lessees and helpers and recently successful in obtaining a monthly raise of \$8.75 in helpers' wages, effected a half-cent per gallon boost in the price of gasoline dispensed at these stations to compensate for the increased wage.

More than 90 per cent of the city's filling stations are owned and operated by individuals or are owned by the oil companies and operated by the lessees.

Standard Oil of Ohio is fighting the action and has refused to raise the price of gasoline sold at the 50 stations owned and operated by the company. ("Union Attempts to Boost Gasoline Price," in *Advertising Age*, June 14, 1937.)

The consumer is always the person who loses in any price-fixing arrangement. Those economists who are wont to hold that the interests of labor and consumers are identical and that the only true consumers are the workingman, will find ample food for thought in this Cleveland incident. Such economists are prone to forget that all consumers cannot work for filling stations or for some other business in which prices have been "upped" by a happy coalition and jointure in monopoly of trade union leaders with business enterprisers.

IF EDGAR HOOVER, the "G" man, went to the Gunmen and Racketeers and asked them what sort of a law they would like; his law, or the one proposed by the successor to John Dillinger, what sort of a law do you suppose would be enacted? Dr. Wiley did not ask any food or drug concern what sort of pure food law they might like or want. In fact every one of these was bitterly opposed to his whole idea of a pure food law. They wanted none . . .

There is so much politics being played around these proposed food bills that they have become a stench. If we had a man with the courage, and ability, of Dr. Wiley there would be a pure food bill of the proper sort come out of this Congress; but as it is we doubt if any bill is passed. Interdepartmental jealousy is playing a large part in this, and the traffickers in human foods are gloating over their victory. If you like that sort of company don't make any move to get a good pure food bill.

If you can gloat over the fact that we have not been able to make the industry do these things which are so eminently for its own advantage, gloat and enjoy yourself. The day will come when they will be done, and done by this industry. (From "Editorials," in *The Canning Trade*, June 21, 1937.)

These strong words were addressed to members of the canning industry by its own trade journal. Its prophecy that no effective bill regulating Food, Drugs, and Cosmetics would be passed by the last session of Congress was correct. It does, however, appear that consumers are making it plain to the better elements in the canning trade that present abuses and inequities will not be tolerated indefinitely.

SOME OF Dr. Michaels' work with copper, iron and zinc has greatly disturbed pea canners of Wisconsin, for he developed a method by which the surplus pea seed crop [i.e., dried peas] can be canned and not only compete with the fresh canned pea, but often command a higher price. He merely soaks the dried pea in a solution containing a certain amount of copper, and, I believe, iron and zinc, and the dried product takes on and retains a fresh green color even long after being canned.

In the light of newer knowledge, it seems a tragic joke on many farmers to look over sick fields of lettuce, tobacco, or corn, and prescribe larger applications of potash or some other element when it is really magnesium, manganese, iron or copper or even arsenic that is needed. ("Metals in Soils, Fertilizer, Foods and Health," by Lee Van Derlinden, in *The American Fertilizer*, May 30, 1936.)

It is still more tragic for consumers and farmers that with the abundance of fresh fruits and vegetables produced in this country, scientists continue to work at ways of putting over new and skillful adulterations and ways of making food-stuffs look what they are not. That dried or over-mature peas may be doctored with toxic metals to look like fresh peas will, we predict, create no good will for the canning industry if the process is adopted on a widespread scale. It is an excellent illustration of why we need an effective provision in any revision of the Food and Drugs Act, requiring that such products be labeled Substandard. (Until recently the Department of Agriculture required that canned, soaked, dried peas had to be labeled "substandard"; this would, of course, distinguish them in the average consumer's mind from fresh, or green, peas.)

